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Sawing and Planing Machines.

Perhaps no class of machinery remained longer unimproved, after the American Revolution, than the saw mills. They were, until a comparatively late period, operated almost exclusively by water, and speed seemed to be scarcely thought of, not to speak of labor-saving appliances. Then "the old saw mill," as an inseparable appendage to the old-fashioned "grist mill," was the exact embodiment of that conservatism which glories in doing thus and so, because "father did it this way," and religiously believes in "letting well-enough alone." But saw mills have not escaped the late spirit of improvement, which is applying the mere vapor of the water, instead of the water itself, as a motor, and daily pointing out various other changes.

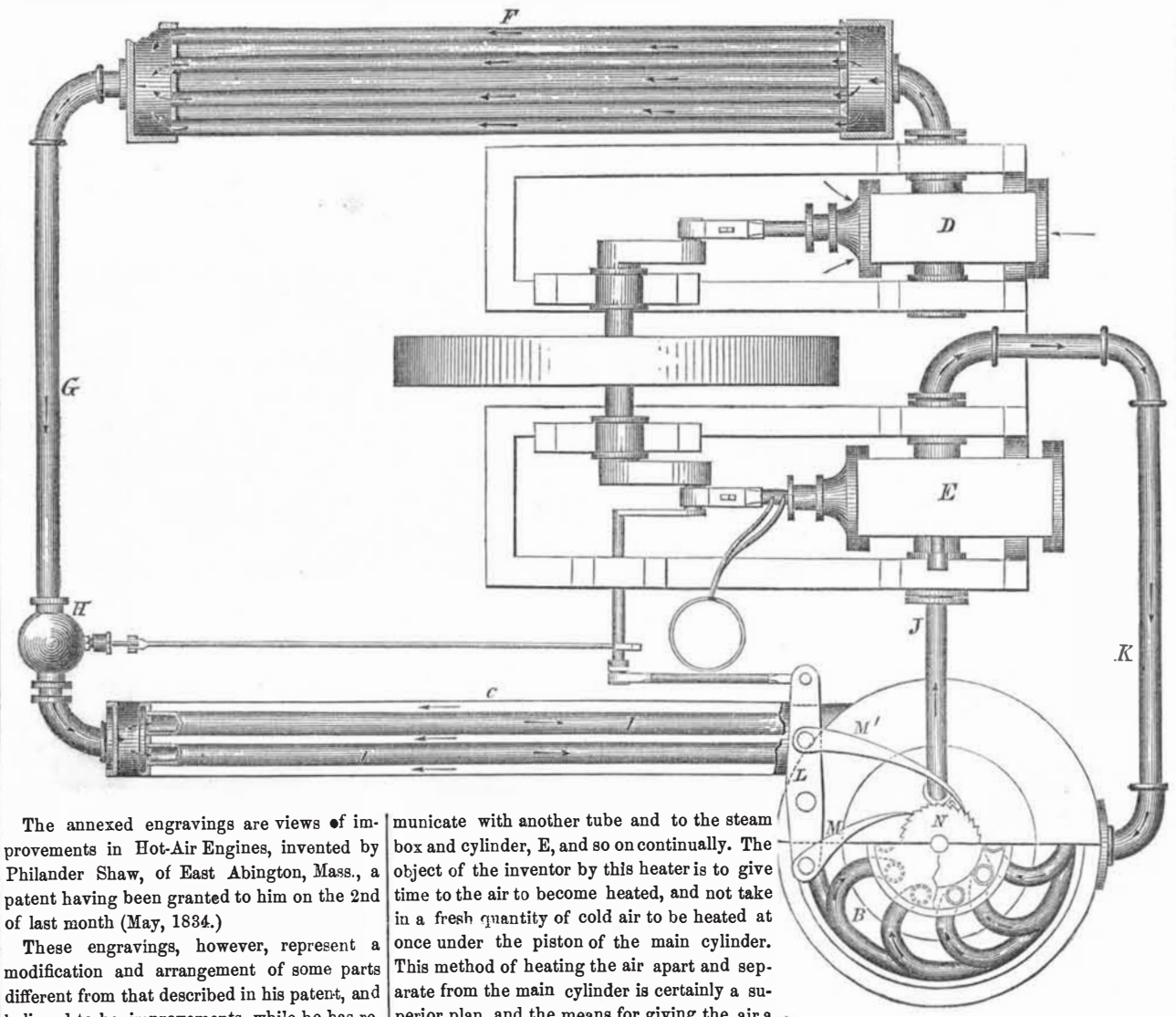
We have before us the specifications of two recent inventions of this class, one of which is put forth as both a sawing and planing machine, while the other claims to be intended for sawing alone. The inventor of the first named is Benjamin Fulghum, of Richmond, Ind., a vicinity which bids fair to become quite noted for its inventors in this and similar lines; he has applied for a patent on what he claims to be "a new machine for sawing and planing timber." Its peculiarity consists in arranging a saw, or a cylinder of cutters, within a carriage which is attached to a jointed frame. Thus the piece of timber operated upon is kept perfectly stationary, while the saw or cutters accomplish their allotted work.

The other invention referred to is claimed by Joseph Immel, of Urbana, Ohio, and consists of a peculiarity in the arrangement of the saw, and also in operating the carriage. Mr. I.'s machine is well adapted, we should think, for the preparation of cord wood and other similar work.

Improved Compensating Balance.

The inventive genius of our Trans-Hudsonic suburb, Jersey City, appears to be commendably awake. William H. Horton, of that place, has taken measures to secure a patent for an improvement of the compensating balances of chronometers of all classes, including clocks and watches. It consists in attaching the curb pins, whereby the action of the hair-spring is controlled, to a lever which is denominated a "curb lever," and which fits loosely around the staff of the balance. He connects this curb lever with the regulating index, or with some other fixed point near the balance, by means of a curved piece of metal called a "compensating curve." By the expansion and contraction of the metal of this compensating curve, pins are made to move upon the hair-spring. Thus a compensation for the expansion and contraction of the latter is obtained. Mr. Horton asserts that, with this advantage gained, and a careful adjustment of the hair-spring, a perfectly regular oscillation of the balance will be secured, together with a certainty of correct measurement of time by any chronometrical instrument to which his improvement may be applied.

SHAW'S HOT-AIR ENGINE.---Figure 1.



The annexed engravings are views of improvements in Hot-Air Engines, invented by Philander Shaw, of East Abington, Mass., a patent having been granted to him on the 2nd of last month (May, 1834.)

These engravings, however, represent a modification and arrangement of some parts different from that described in his patent, and believed to be improvements, while he has retained all the principal features claimed in the patent.

Figure 1 is a top view of the whole apparatus (the cylinder being an oscillating horizontal one) showing the air-compressing chamber, the entrance heating tubes, and the final heating tubes in section. Fig. 2 is an elevation, partly in section, of the air heater. (See next page.) The same letters refer to like parts on both figs.

A is the furnace; the heated products of combustion pass up on the outside of the final air-heating tubes, B, through the tubes in B', and then through the smoke pipe, C, in which are the entrance air-heating tubes, I. D is the feed air pump, and E is the main cylinder, in which is the working piston operated by the hot-air. The air pump, D, takes in air from the atmosphere, and forces it into the compresser, F, where it is maintained at 60 lbs. on the square inch. From the compresser, F, it is admitted into the tubes, I, in the smoke-pipe through the pipe, G. There is a valve in the pipe at H, which cuts off and lets in the air to the tubes, I. The heater, B, is composed of a series of tubes, forming a coil, which are connected with a perforated rotating top-plate moved round by the vibrating beam, L, which operates the ratchets, M M', which take into the teeth of the ratchet wheel, N, secured on the cap of the rotating heater coil, B. The air fed into the tubes in the smoke-pipe, takes up some heat from the escaping gases, and is admitted by rotation into the several pipes of the main heater furthest from the fire, while each tube in the coil which receives the concentrated heat of the fire, contains the exact quantity of air to be admitted into the main cylinder each stroke; then for the next stroke the top plate is moved one notch, and brought to communicate with another tube and to the steam box and cylinder, E, and so on continually. The object of the inventor by this heater is to give time to the air to become heated, and not take in a fresh quantity of cold air to be heated at once under the piston of the main cylinder. This method of heating the air apart and separate from the main cylinder is certainly a superior plan, and the means for giving the air a long heating circuit from the time it enters the smoke-pipe tubes to its final admission into E, is very ingenious. It will be observed that the hot air, after acting upon the piston, is employed to feed the fire. It is exhausted through the pipe, K, and passes up through the grate, as shown in fig. 2. This is a good idea and must effect a considerable saving of fuel.

The piston is kept cool, and the packing preserved from being burned out by a stream of water admitted through the hollow piston rod by tubes, as shown, and which circulates through the piston which is also hollow. The higher the air becomes elevated in temperature its pressure increases, therefore as it receives its concentrated heat of the fire in the coil heater, B, its pressure is far higher there than where it is injected into the entrance heating tubes, I. The advantage of this arrangement is, that it relieves the engine from working against the highest back pressure in feeding in the cold air, as it is fed into the feeding apparatus, where the temperature is comparatively low, while it is taken into the main cylinder, E, at its very highest temperature and pressure. The heads of the coiled pipes of the heater, B, are inserted close to the top plate, this latter acting the part of a rotating disk valve. It is intended to have a stream of cold water circulating through the compresser, F, so as to carry off the heat of the air developed by compression, and thus have the air in as condensed a state as possible when it enters the heater.

We cannot see the advantage to be derived from thus reducing the temperature of the air when that same temperature has to be given to it again—first cooling and then heating the air before it is used.

The main cylinder is 2006 inches area, and that of the pump 1209, area; the stroke of both is two feet. The power of this engine will be according to the quantity of air heated in a given time, and the temperature to which it is raised,—in other words, the pressure and velocity. The heat applied imparts the quality of expansion to the air. Expansion is the force of hot air and it is measurable in quantity, the same as the force of gravity,—the quantity of water which falls in a given time through or down a certain length of space. Thus 491 volumes of air will expand to 982—double the volume—when it becomes heated to 491° Fah., and at this temperature will exert a pressure of 15 lbs. on the square inch. This degree of heat is too high to be used in an engine, it would be impossible to keep the piston lubricated while exposed to such a temperature. The main cylinder, E, contains 27·85 cubic feet of air, and the feed pump, D, has a capacity of 16·79 cubic feet.

To make the calculation easier, but not the less plain, let us assume that the capacity of E is 28 cubic feet, and that of D 16—the difference being 12 or three-sevenths in favor of E, against the feed pump, D. As the large cylinder can only receive one pump full from D every stroke, however much it may condense the air in F, it follows that the average pressure in E, during the stroke, if the air is heated to 491°, will be 15—6 3-7=8 4-7 lbs. on the square inch during the stroke. If the air could be heated to give 50 strokes per minute, the power of the engine, would be $2006 \times 8\ 4\text{-}7 \times 100 \div 33{,}000 = 52{\cdot}10$ horse power. But then to do this the heater must be able to heat 600 cubic feet of air to 491° above its atmospheric temperature every minute. The "Ericsson" engines made only 19 strokes (semi-

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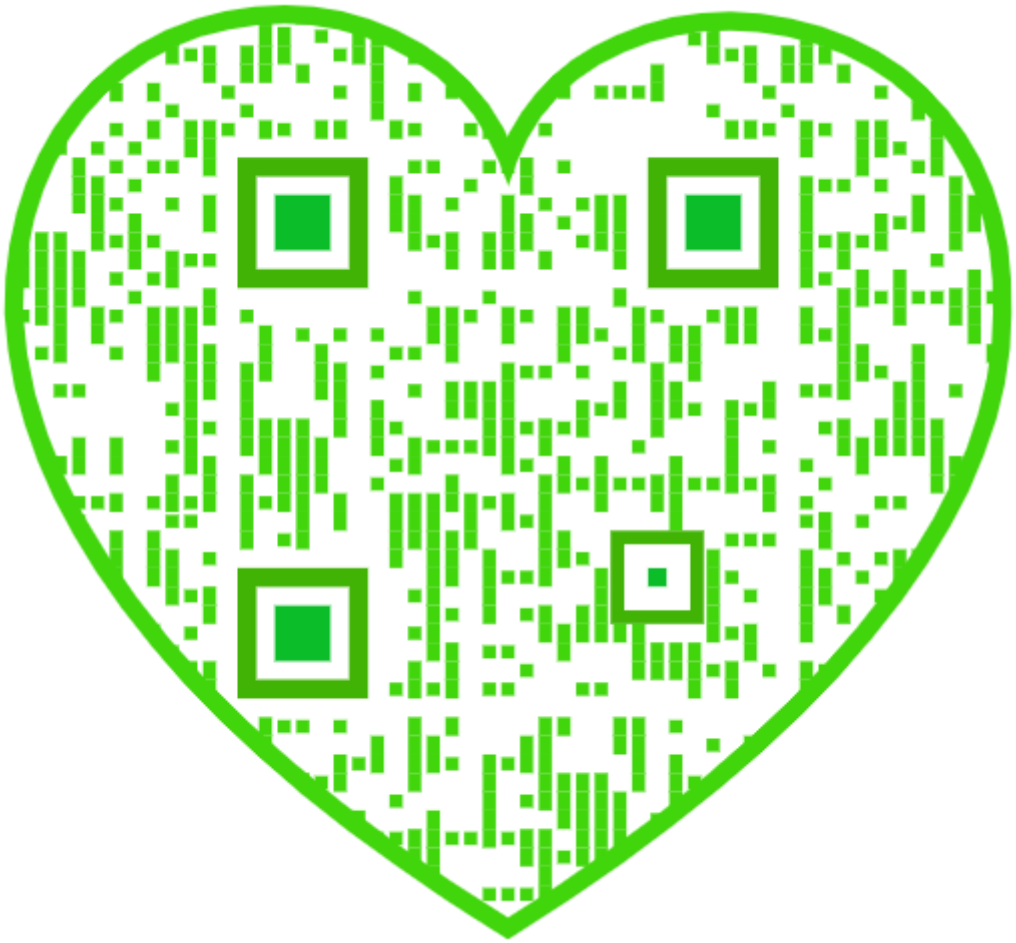


revolutions of crank) per minute, when we saw them in operation. The great bulk of air to be operated upon in an air engine, is the great obstacle to its use.

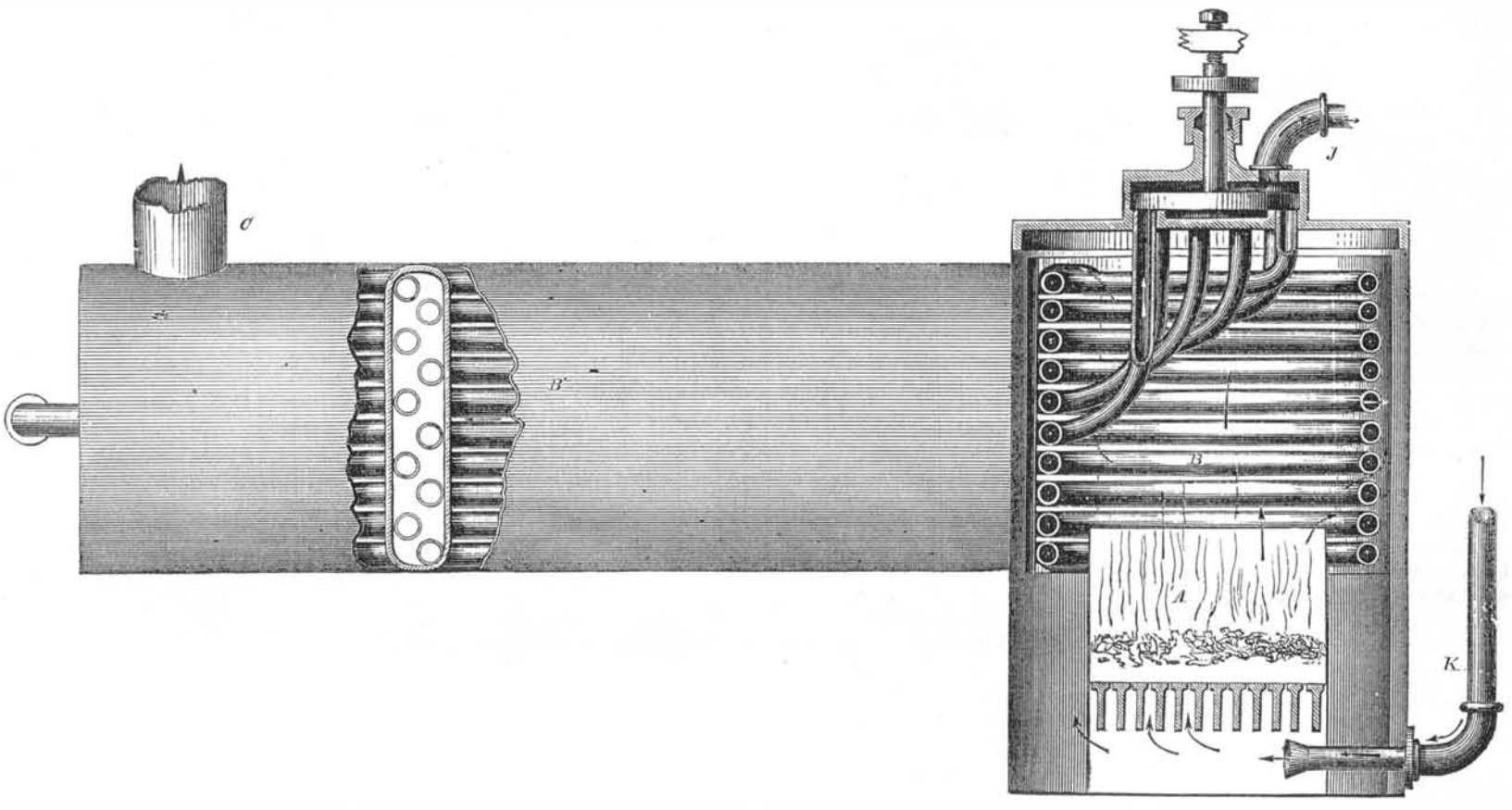
The fact is here revealed to us plainly, that it is impossible to use condensed air in air engines, when the feed pump is only equal or less than the main cylinder. It requires the feed pump to be of greater capacity than the main cylinder to do this.

The new "Ericsson" engines, in which highly compressed air, was stated to be used, were delusions, because the feed pumps were of less capacity than the main cylinders. The quantity of hot air admitted into the main cylinder every stroke, and its temperature, are the exponents of its force. For example, if the pump, D, feeds the air into F, at 60 lbs. and the quantity contained in the pump is fed into the heater, and takes up 491°, and then passes into the main cylinder: this is simply 16 cubic feet of air at atmospheric pressure reduced to 4 cubic feet. Thus 16×15 (491°) $\div 4 = 60$; and $15 \times 4 = 60$.

The question of compressed and non-compressed air, is just as broad as it is long, for it requires the same amount of power to compress it as is obtained afterwards from the same air in its compressed state, so that the simple question in relation to the power of any hot-air engine is resolved by the quantity of air at atmospheric pressure, heated to a certain temperature in a given time—the degree of heat determines the pressure, and the space through which it will move the piston.

When properly understood, the question is very simple. We regret to state that scientific men—Professors in some of our colleges—who have written on this subject, have involved it in mystery, by rushing into page after page of symbols and figures, to explain a question that requires only a very few figures in the most common rules of arithmetic. Calculating the effective force of hot air in a cylinder (under a certain pressure) at different points of the stroke—is labor lost in discussion, for such calculations merely relate to that economy of its use, which is equal to that of steam, and which is practiced in steam engines.

Figure 2.



The great question to be asked in discussing hot air versus steam, is what advantage has air over steam? What is there in its nature that would render it superior as a motive agent to steam? It is far inferior to water raised into steam, as a motive agent. The only single quality that it has, reasonably, over steam, is its inferior capacity for heat. Thus while the capacity of water for heat is 1·0000; air is only 0·2669, or 0·7331 less. But one cubic inch of air heated to 210° will raise only 6·12 lbs. one inch, while 1 cubic inch of water raised to steam at 212° will lift 15 lbs. 1728 inches. Now let us suppose that the air is 815 times lighter than the water, and of 3·75 inferior capacity for heat, the advantage is still with the steam:—thus $1728 \times 15 = 25920 \div 815 = 31 \div 3{\cdot}75 = 8$, or about two pounds on the square inch. The great bulk of air, in comparison with that of water—it being 815 times lighter than water, is an objection to its use. It requires huge cylinders amounting to about 217 times greater frictional surface than steam engines. It acts chemically upon iron and oxydizes the parts exposed with great rapidity. The moisture of steam relieves the piston of much friction, and this is the reason why anhydrous steam (stame) when mixed with moist steam, produces better results than the *stame*. Steam at the low temperature of 283° exerts a pressure of 50 lbs. on the square inch, while air at 491° exerts one of only 15 lbs. The steam boiler is a reservoir of force, not subject to those sudden changes involved in an air heater, when such an immense bulk of air has to be heated for every stroke of the piston.

Mr. Shaw is a sincere and honest explorer in this field. He presents his engine to the American public, and has courted a candid criticism, and for this he deserves the thanks of the community.

A World's Fair in France.

Preparations have been making on a grand scale in France, ever since 1851, to have a World's Fair, (like that in London), next year, 1855. The exhibition is to be opened in Paris, on the first of next May. There will be, strictly speaking, two great exhibitions—one of industry, including agriculture and manufacture; the other of the fine arts. These exhibitions will be simultaneous. A Board, or, as the French term it, a Commission, divided into two sections, has been nominated, who direct and superintend each its proper branch. The President of the general commission is Prince Napoleon.

The warmest hopes are entertained and expressed that the United States will be well represented in all its great strength, as well artistic as industrial. The various articles sent for exhibition will be received between the 15th of January and the 15th of April, It is desired that only those liable to suffer from too long package be sent at the latter date. The heavy and cumbersome descriptions should be ready for reception before the end February.

Books and Msgazines with Uncut Leaves.

We advise all publishers of books and magazines who follow the practice of leaving many of their leaves uncut, to alter their system, and send no book, magazine, or pamphlet from their offices hereafter, with its leaves untrimmed We believe it would ultimately inure to the benefit of all publishers of magazines to trim their leaves, for it would undoubtedly tend to increase their circulation.

A Large Straw Cutter Wanted.

MESSRS. EDITORS.—Permit me to call the attention of inventors to a want which farmers in the West feel severely. We want a machine for cutting straw and corn stalks—one which will allow us to throw in our straw by forks-full. We do our thrashing by machines, and our straw is not in a fit condition to cut to advantage in one of the machines which are in use at present. If this want could be supplied we should be enabled to keep one-third more stock, as we could feed all our straw, which now often stands year after year, in piles in the yard or fields, and finally disappears. Such a machine would add 25 per cent. to the capital of the Western States, as it would enable farmers to feed all their straw which now they feel to be an incumbrance. A FARMER.

Detroit, Mich., June 15, 1854.

[Many of the small straw cutters now in use, have but to be enlarged, and worked by horse, steam, or water power, to answer all the purposes desired by our correspondent. More work, by almost any machine, only requires more effective force to drive it, that is providing its parts are strong enough to be driven at a higher velocity. All straw cutters, in fact every farming implement and machine, should be constructed with a view to simplicity and strength. We have no doubt but many of our readers can furnish straw cutters to meet every want of our Michigan Farmers.

The Tea Culture Again.

The "Dunkirk Journal" says that a gentleman passed through that village *en route* for Cincinnati, with some twelve Chinese tea culturists, for the purpose of testing the practicability of growing tea in the vicinity of Cincinnati. Since the death of Mr. Junius Smith, of South Carolina, we have heard nothing of the progress of the tea culture in the United States.

A Curious Incident.

Mr. Flauddin, in his narrative of a residence in Persia, relates a curious incident which occurred when he was at Ispahan:—

"The Persian servant of a European had been stung by a scorpion, and his master wished to apply ammonia, the usual remedy in such cases, but the man refused, and ran off to the bazaar. When he returned he said he was cured, and appeared to be so. The European, rather surprised at this almost instantaneous cure, questioned him, and found that he had been to a dervish, who, he said, after examining the wound and uttering a few words, had several times touched it with a little iron blade. Still more astonished at the remedy than the cure, the European desired to see the instrument by which the latter was said to have been effected. At the cost of a small pickech he was allowed to have it for a few minutes in his possession. After a careful examination, finding nothing extraordinary in the instrument, he made up his mind that the cure was a mere trick; that the dervish was an impostor; that the scorpion sting had not penetrated, and that his servant had been more frightened than hurt. He threw the blade contemptuously upon the table, when, to his great surprise, he beheld it attach itself strongly to a knife. The quack's instrument was imply a magnet. But what power had the loadstone's attraction over venom? This discovery was very odd; incredulity was at a nonplus, and yet the man stung by the scorpion was cured, and he who had cured him was in great renown at Ispahan for the treatment of that sort of wound.

Refining Gold.

The gold is melted with three parts of silver, and, when in a melted state, is thrown into cold water. This has the effect of dividing the metal into small flakes, which are thrown into glass matrices and treated with nitric acid, which dissolves the silver and leaves the gold untouched. The gold, after this process, is taken from the matrices, and collected in a large copper pan or other vessel. Any one to look at it, so far from taking it to be refined gold, would imagine it was a collection of worthless brown sand. It is then washed and dried, and afterwards put into a crucible, re-melted and cast into bars of fine gold.

The liquid into which the gold was put for the purposes of disengaging the silver, and which it holds in solution, is taken and thrown into a large vat containing salt and water. The mixture is kept in a continual state of agitation. The silver, by this means, is precipitated as an insolvent chloride.

This white chloride is washed thoroughly in warm water, it is then put into a proper vessel and mixed with granulated zinc. Under violent ebullition for sometime, the nitrogen gas is disengaged and the silver left pure. The chloride having a greater affinity for zinc than silver, unites with the zinc and forms a chloride of zinc.

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[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JUNE 20, 1854.

VENEER POLISHER—Edwin Allen of South Windham, Conn.: I do not claim the belt separately, for belts or their equivalents have been previously used for similar purposes.

But I claim the combination of the belt and pressure cylinder, constructed, arranged, and operating in the manner set forth.

METALLIC GROMMETS—John Allender, of New London, Conn.; I claim making that portion of the tube put through the ring to correspond, or nearly so, with the corners of the canvas or cloth, so that when they are bent down upon the canvas, they double or bend it over the edge of the ring and confine it firmly, as set forth.

Second, I claim the scores in the ring which correspond, or nearly so, with the corners of the cloth and with the points of the tube, in combination with the points of the tube aforesaid, as described.

Third, I claim scoring or roughening the surface of the rings where they come in contact with the cloth so as to make them hold the canvas firmer and better.

Fourth, I claim making or inserting points in or on one or both of the rings to extend through the canvas into the opposite ring or otherwise.

Fifth, I claim riveting the points of the tube which are bent over on the cloth or otherwise, as described.

QUARTZ CRUSHERS—D. C. Ambler, of New York City: I do not claim the revolving trough or the revolving spherical balls when said balls are not attached to proper axes.

But I claim, first, the combination of a revolving trough, with balls located therein, said balls being attached to shafts, as described, and having further imparted to them a pendulous bounding motion, as specified, whereby quartz or other similar substances may be stamped, crushed, and pulverized in the same machine.

Second, I claim the combination of a revolving trough with balls revolving therein by friction; but this I claim only when these balls are attached to shafts, as specified, whereby quartz, etc., may be pulverized and crushed, as set forth.

SETTING OF STEAM BOILERS—D. C. Ambler, of New York City: I do not claim the form of boiler described, neither do I limit myself to the use of a boiler provided with only two heaters, as more might sometimes be advantageous, neither do I claim the method of distributing hot air, nor the protecting of steam surface by means of brick or tiles.

But I claim the method of setting a boiler, as described, in so far as the same consists in grate surface extending the whole length of the boiler, or nearly so, when the same is employed in connection with a midriff located as described, and causing the products of combustion to travel in reverse directions, as specified.

I also claim tiles shaped as described, in connection with bearers, shaped and located as described, for the purpose of forming a midriff or division between the flues, as specified.

PROCESSES FOR TREATING PAINT—Gabriel Blondin, of New York City: I claim hardening and fixing paint of which albumen is a constituent, by coagulating the albumen after the paint has been spread, as set forth.

PAINT COMPOSITION—Gabriel Blondin, of New York City: I claim the composition of ingredients, described, for the purposes specified.

GOVERNING THE ACTION OF VALVE COCKS—F. H. Bartholomew, of New York City: I claim the method of controlling the motion of a valve by means of a variable chamber combined therewith, as described, the said chamber having a small opening, or its equivalent, communicating into it, through which the chamber shall always fill or discharge, and whereby the discharge or flow of water shall be governed, as set forth.

CUT NAIL MACHINES—T. H. Barlow, of Lexington, Ky.: I claim in combination with the pairs of fixed stocks, and cutters, the vibrating stocks and cutters, when said vibrating stocks and cutters are so arranged as to be capable of being operated from one rock shaft, by one cam and lever, and the pairs or sets of stocks constitute the griping jaws for holding the blank whilst it is being headed, and thus dispensing with the usual mode of griping, as described.

I also claim, in combination with the vertical oscillating nail plate holder the escapement or its equivalent, for the purpose of gauging and feeding up the nail plate to the cutters and gripers, as described.

I also claim the operating of the nail plate holder from the heading levers, through the medium of the arms, sliding bar, lever, and escapement, or their mechanical equivalents, as described.

FLOUR SIFTER AND RENOVATOR—M. S. Bassett, of Wilmington, Del.: I claim the arrangement of the radial rollers and horizontal brushes with the coarse and fine seives, for the purpose of renovating damaged and lumpy flour, as set forth.

GRAIN WINNOWERS—Joseph Bone, of Warrenton, O.: I do not claim the mere separation of grain into several grades according to specific gravity, by the action of the suction fan and the arrangement of a single set of tubes, as such is well known.

But I claim arranging and connecting a series of two or more sets of separating passages, as set forth, so that the grain may be carried through the entire series of separating passages as often as required by the operator for thoroughly cleaning and separating the same.

HIGH PRESSURE STEAM ENGINES—Benjamin Crawford, of Pittsburg, Pa.: I claim the method of producing a vacuum in condensing engines by allowing a part of the exhaust steam to escape into the atmosphere without resistance, by a flap valve, as described, before the condenser is opened, and then condensing the remainder by opening the communication between the cylinder and condenser, whereby the weight, bulk, cost, and expense of working the condensing apparatus are diminished, and the power and efficiency of the engine are increased, as set forth.

PRINTING WOOLEN AND OTHER GOODS—Thomas Crossley, of Boston, Mass. Patented in England, April 5, 1854. First, I claim the combination of the series of blocks with the stationary cases, or their equivalents, and the endless chain register operating as described, by which any number of colors may be simultaneously applied, and a section of the figure be completed each time the blocks are depressed.

Second, I claim the described method of holding and feeding the material to be printed by means of the endless chain and hooks, by which the material is held rigidly until the operation is completed, and thus a perfect and unerring register is obtained.

Third, I claim the method, as described, of giving motion to the blocks by means of the sector, or its equivalent, whereby they are moved in with a slow motion and out with a rapid motion, and are caused to remain stationary at the two extremes of their traverse, while they receive their color and the impression is made.

STEAM ENGINES—B. F. Day, of Philadelphia, Pa.: I lay no claim to the double engine connected to cranks at right angles on one shaft; neither do I claim the principle of using steam expansively in connection with a cylinder or engine, using it directly from the boilers, as these are described in the patent granted to Daniel Barnum on the 19th Sept., 1846; neither do I claim the arrangement of valves as patented to said Barnum.

But I claim, in contradistinction from allowing the steam to pass directly from one cylinder to the other, the taking of the steam from the receiving cylinder to a steam chest provided with valves and ports, by and through which the steam is admitted to, and exhausted from the expansive cylinder by which means I retain a longer expansive action of the steam, as described.

WEAVING DOUBLE CLOTH—Saml. Fay, of Lowell, Mass. I claim the manufacture of a fabric which has one face of wool and the other of cotton or linen, as described, that is to say, in no place does the warp, which is upon one side of the cloth extend into the surface of the other side of the cloth.

CONSTRUCTION OF REED MUSICAL INSTRUMENTS—F. A. Gleason, of Rome, N. Y.: I claim the hammers arranged in each vibrating air chamber, in connection with the wire spring and valve, also in combination with it the vibrating air chambers under each reed, and the modulating air chambers, with the small apertures, over the reeds, all arranged and operating as described and for the purpose specified.

TOOL HANDLE—G. W. Griswold, of Carbondale, Pa.: I claim so combining a double acting pawl and star-shaped ratchet with the stock and handle of a screw driver or gimlet, as that by pressing the thumb or finger on one arm of the pawl and turning the handle, the screw may be driven into the wood, and by shifting the thumb or finger on to the other arm of the pawl, and continuing to turn the handle in the same direction, the screw or gimlet shall be drawn out of the wood, as described.

PRODUCING CONTINUOUS CIRCULAR FROM RECIPROCATING RECTILINEAR MOTION—C. S. Harris, of Holyoke, Mass.: I do not claim the combination of a bow and string or band, with a pulley, for obtaining a circular motion from a rectilinear motion, nor the mere duplication of such devices.

I claim so combining with the bow or bar, and the two bands, and the handle, or its equivalent, a vibratory or rocker lever, that during the reciprocating rectilinear movements of the bar or bow, caused by the power applied to such rocker lever, it shall be made to operate so as to alternately tighten and loosen each cord upon the pulleys of the drill stock, as specified, and cause the drill stock to be rotated, as described.

CAST-IRON CAR WHEELS—John Henry, of Lynchburgh, Va.: I do not claim a central plate running from the hub to the rim, and not connected with the inner and outer plates, as such a wheel was patented by Frederiok Warbeck, Nov. 6, 1847.

But I claim the intermediate continuous plate extending diagonally from the hub to the rim, in a cast-iron wheel having double plates or disks, and connecting the two plates of the wheel together, as set forth.

EXTRA YARD TO TOPSAILS—Frederic Howes, of Yarmouth, Mass.; I claim the application of an extra yard, supported by truss, crane, or brace, as described, or any other substantially the same, and which will produce the same effect.

CARRIAGE TOPS—S. F. Huntingdon, of Syracuse, N. Y.: I claim the method of supporting the top by means of an inverted bow inside the covering of the top, and attached to or standing upon the back of the seat and having its ends firmly attached to the back bow of the top, or any analogous device effecting the same object.

I also claim the method of dropping the top by detaching this bow from the back of the seat, and supporting it in proper position, when dropped by flexible or elastic stays, as shown.

I also claim the extension of the jointed brace forward of the front bow, in such a manner as to form a handle or lever within reach of a person in the carriage, and by which the brace may be worked, as set forth.

MODE OF MOLDING BRICKS—Nathan Johnson, of Noblesville, Ind.: I do not claim forming brick from mold frames placed on the ground, as described; But I claim the mode of at once distributing the mortar, filling the molds and removing the surplus material, viz.: by means of the lute applied as set forth.

I claim further, that with them bricks can be made without the assistance of off bearers, and at one-fourth less expense than they can be made in any other way.

I further claim that I have fully tested the foregoing plan.

[The two last are queer claims.]

GAS METERS AND REGULATORS—C. C. Lloyd, of West Philadelphia, Pa.: I do not claim the combination of a float with a water valve. Nor do I claim the combination of a float with a valve, so as to operate simply as a governor.

But I claim the application of the principle or mode of operation described, whereby the double purpose is effected of equalizing or regulating the pressure of the gas within the meter, and of shutting off the gas when the water gets too low, by combining the valves with one and the same float, all within the meter, as set forth.

PAINTERS' BRUSHES—J. S. Martin, of Boston, Mass.: I claim the application of an elastic tubular binder to a brush, instead of an inelastic cord or binder, as commonly used, the said elastic binder being composed of caoutchouc or other suitable material.

RADIAL ARMS FOR CAR BRAKES—T. G. McLaughlin, of Philadelphia, Pa.: I am aware that a radial arm turning loosely on the brake lever shaft of the tender, and raised to a horizontal position by a spring and lever in connection with the means of operating the brakes of the tender to which it was attached, has been patented. Therefore I do not claim this.

But I claim the employment of the radial arms in combination with the catches, or lips, formed on the radial arms, for the purpose of relieving the horizontal shaft on which the radial arms are firmly secured, of the pressure or force which may be exerted against the ends of the radial arms, when operating the brakes of the several cars in a train by the means that have been herefore invented by me for that purpose.

BURGLARS' ALARM—D. E. McDougal, of Springfield, Mass.: The arrangement of the clamp brace, guard, and plate for securing doors and windows being already patented by me May 31, 1853, I do not claim the same device.

But I claim the clamp, brace, guard, and plate, in combination with the hammer, the spring, and dog, the above parts being constructed and arranged as set forth.

STEAM ENGINE REGULATORS—Anson Merriman, of Middletown, Conn.: I claim the chamber, cock, and safety valve, holding a portion of steam in store, and in combination with the pump, drawing from and returning it to the same source, and acting on the piston during the dead points of the engine.

Secondly, I claim the aperture chamber and safety valve, so weighted as to hold the steam at greater pressure than in the boiler, in combination with the pump or pumps, for forcing the steam into the said chamber, for forming a magazine to feed the cylinder at the moment the engine is passing the dead points, and operating in the manner and for the purpose set forth.

WATCH CHAIN SWIVEL—N. F. Mathewson, of Providence, R. I.; I do not claim the combination of the spring, and its inclosieg slide, for locking and unlocking the hook: nor merely making the loop or bow of the hook in separate sections.

But I claim constructing the spring inclosing slide with the smaller or opening section of the loop fast to it, and gearing the said slide by square or angular recess in it, and corresponding shaped shoulder on the shank, with the main section of the loop for operation, together, in the manner specified, whereby the hook is opened and closed with greater facility, and the opening section firmly held in its open position without applying the finger or hand thereto, and without destroying the loop form of the hook, and without employing a cross swivel joint in the loop, by which construction, combination, and arrangement numerous advantages are obtained, and the device improved.

SLATE FRAME—Edmund Morris, of Burlington, N. J.: I claim constructing a slate frame of corresponding halves, of such a shape that a single joint combines them with each other at the same time that it firmly secures the slate between them, as set forth.

BREAST PUMP—O. H. Needham, of New York City: I claim the combination of an air pump operating as described, with a nipple shield or cupping shield made of flexible material, as set forth, by means of a flexible tube, so that the motion of the working of the pump will not be felt upon the parts operated upon, and the patient can operate it herself, and regulate the action.

TURNING CASKS, &C., FROM SOLID PIECES—J. P. Osborn, of Staunton, N. J.: I do not claim making the bodies of barrels, casks, tubs, &c., by turning them in one piece out of the solid block.

But I claim, first, the tool bearers, cutting in contrary directions, in combination with the cross-heads, as described.

Second, I claim the combination of the cross-heads with the connecting rods and feed screws, in the manner and for the purposes set forth.

Third, I claim the method described of adjusting the position of the tool bearers.

CAST-IRON VISES—Chas. Parker, of Meriden, Conn.; I claim casting the movable jaw or chap of a vise so as to inclose and secure by the operation, one or more wrought-iron bars within the tail or guide rod at or near the point of greatest strain, said bars being enlarged or bent at the ends, the better to secure the same to the casting, in order to act as a chord or chords to resist tensile strain and thereby secure the maximum of strength with the maximum of metal, as described.

RAILROAD CAR BRAKES—B. F. Reimer, of Philadelphia, Pa.: I do not claim the mechanism described, for operating the brakes of a train simultaneously,

But I claim the brake, consisting of the perpendicular rod, the guides, the rollers, the chain, and the mode of attachment, the whole being arranged as described, for the purpose of operating either by the mechanism for acting simultaneously upon all the brakes in the train, or independent of the same, by the lever,

SHIPS' CAPSTAN AND WINDLASS—Jessee Reed, of Marshfield, Mass.: I claim the arrangement of the movable capstan with the two windlasses, constructed and operating as set forth, so that either windlass may be turned in either direction by operating upon the single capstan.

DRYING GRAIN—S. B. Robinson, of Oswego, N. Y.: I claim a trough or cylinder with a perforated bottom provided with a conveyor or stirrer, in combination with a blast of heated air forced through the perforated bottom mentioned, constructed and arranged as described.

TENTERING CLOTH—Warren Shaw and P. G. Green, of Wales, Mass.: We claim the adjustable obliquely situated tenter wheels provided with laterally playing tenter points, in combination with the oscillating guides, arranged and operating in such a manner as to seize the cloth and stretch it uniformly, at the same time bringing its edges perfectly even and straight, in which condition it is delivered to the tenter points of the drying apparatus, to be retained thus till dried and received by the folding apparatus, as set forth.

GAS RETORTS—A. R. Terry, of Detroit, Mich.: I claim the application to gas retorts of a coating which consists of a series of layers or laminæ of luting and metallic wrapping, as specified.

ORDINARY AND SUPER-HEATED STEAM COMBINED FOR HEATING PURPOSES—C. E. Wethered, John Wethered, and Samuel Wethered, of Baltimore, Md.: We claim the application of the combination of ordinary steam and super-heated steam (which combination is effected by bringing them together in pipes of any convenient form, before or at the point where their contents are discharged, for the purposes of boiling, evaporating, drying, melting, and heating.

RAISING AND LETTING FALL CARRIAGE TOPS—Joseph R. Winchester, of Medina, N. Y.: I claim the cross-brace attached to the outside braces and the center part of the outside braces performing, as it does, the office of a double brace, and the two attached to a carriage top or cover, in connection with the other portions of the outside braces which will produce the desired effect.

FOLDING AND MEASURING CLOTH—Wm. C. Wright, of Boston, Mass.: I claim, first, making the folding table of a machine for folding and measuring cloth to move with a reciprocating motion, so as to make the folds, and determine their length, and also the making said motion adjustable in order to change the length of the folds to be made and measured.

Second, I claim the combination of the moving folding table operating as specified, with the guiding folders and the elongated holders to each side of the table for folding and guiding the cloth to be folded, and holding it, as set forth.

Third, I claim making the said holder adjustable up on the end of the folding table so as to accommodate different length of folds, as set forth.

Fourth, I claim relieving the cloth, when folded, from the folders and holders, so that it may be removed from the folding table by raising all of them simultaneously by means of the treddle connected to the said folders and holders through the mechanism described.

SETTING AND HOLDING PENS FOR PAPER RULING—S. W. Collins, of Charlestown, Mass. (assignor to W. O. Hickok, of Harrisburgh, Pa.: I claim the extension pens and adjusting beam, constructed and combined for the purposes and in the manner set forth.

MACHINES FOR CUTTING OUT BOOT SOLES—Luther Hill, of Stoneham, Mass. (assignor to Luther Hill and Lorenzo Stratton, of Fentonville, Mass.: I do not claim the invention of a bed knife, nor the combination of a press platen or follower therewith: nor the making the follower with its under surface a plane surface, for the purpose of stamping out soles from leather.

But I claim combining with the under side of the follower and with the cutter, as described, a sole bender or former, or projection in relief, of the form necessary to bend the sole into the shape it is to have when fixed on a boot or shoe, the said sole former, by bending the leather, causing its edges to stand perpendicularly to the plane of the outer edge of the upper surface of the concave side of the sole, as specified.

OMNIBUS REGISTERS—Levi W. Mallory (assignor to W. Morris) of Philadelphia, Pa.: I claim the combination of the rod, guide, lever, spring, coupling, and eccentric ratchet or trigger, operating as set forth, to prevent the ringing of the bell until the fare is registered.

PADLOCKS—Stephen White (assignor to H. C. Jones), of Newark, N. J.: I do not claim simply notching one of the bolts to act as a stop for the reception of a tumbler or spring dog, or any equivalent,

I claim making the sliding bolt with a shoulder, or its equivalent, acting as specified, in combination with the turning bolt, both entering the mortise of the shackle in opposite directions, as set forth.

Electricity as a Motive Power.

Much has been written on this subject, yet, in my opinion, the difficulties connected with it have hitherto been but imperfectly and somewhat incorrectly pointed out, on account of the impossibility of explaining by the process of simple reasoning, a subject which requires the aid of algebraical language.

However, as it is important that the question should be settled, and that our friends should be prevented from taking up false speculations, we think it desirable to make no mention of the secondary difficulties.

When a piece of iron is surrounded by several circuits of copper wire, if the galvanic electricity runs through this wire, the iron becomes a magnet and the power of attraction is indeed wonderful; however, this power is reduced to almost nothing at a trifling distance. If the distance is taken double, the attraction will be only one-fourth—and so on, so that we may say that the attraction of a magnet is in the inverted ratio of the square of the distance. By looking minutely at this side only, we may erroneously conclude that a small machine of any form whatever, cannot be increased without losing its proportional power.

Let y be the power, and x the distance; we will have between these two quantities the following relation: $y=1\div x^2$. In this formula, if we suppose the distance $x=0$, the power, y, will be infinite: consequently the center of attraction of an electro magnet must be in the interior of the iron and the distance of that point from the surface, must be in the ratio of the dimensions of the magnet. Let a be that distance, the formula will become $y=1\div(a+x)^2$ in which $1\div a^2$ will be the power of the contact.

Now let us suppose that the dimensions of the magnet is double, the weight of it will be eight times greater, and the expression of its power will be $y=8\div(2a+x)^2$, in which $8\div 4a^2$ will be the power of the contact, and it is easy to notice that this expression can never be 8 times the former one, and for those who understand the rule of integration, they will find the same deficiency in the integral of the developement of the power at any distance whatever.

To this reasoning we will add another one, more serious. It has been proved that by increasing an electro-magnet, the electrical current requires a longer time to bring it to its saturation; and that time appears to be in direct ratio with the dimension: consequently the velocity of its action diminishes, and since a dynamic power may be represented by the weight in motion multiplied by the velocity, it follows that any machine in which the attraction of the magnet generates the power, cannot be increased without disappointment.

By these considerations, it seems that the problem of electricity, as a motive power cannot be resolved; still this conclusion may not be correct, because if it is a folly to employ the power of the electro-magnets, it is not so if we employ directly the power of an electrical current in moving pieces of iron or in moving another electrical current; because their actions are in the inverted ratio of the simple distance, and infinitely prompt.

Prof. Page appears to be the first who has approached to this solution. Let us hope that science will discover the way to employ the influence of the current, for the employing of any other action would be erroneous.

I will conclude by the following advice to your readers:—"Friend, if thou are called to patronize an electric machine, observe closely it some pieces of iron are attracted towards each other, and if it is the case, run away if you don't want to lose your time and money."

P. VERGNES.

New York City, 1854.

The Cashmere Goat an adopted Citizen.

The editor of the "Philadelphia Ledger" says:—"Now we have heard a great many guesses and opinions whether the goat that produces the fine hair, out of which are manufactured the justly celebrated Cashmere shawls, can be propagated in this country; and we are happy to announce to our countrymen that it can be done. A friend has deposited with us, for a short time, three specimens of this hair, one of a buck, one of an ewe, and the third of a kid, 9 months old, all of the pure breed, which are now being bred and are in a thriving condition in the western part of the State of Georgia.

California Gold Inexhaustible.

Dr. Trask, who was appointed by the California Legislature to investigate the productiveness of the gold mines of that country, has published a long report, and the results are favorable to the belief that the gold of the State is inexhaustible for many years, and may be profitably worked for a long period.

Shipbuilding in Maine.

The "Rockland (Me.) Gazette," thinks the shipping now on the stocks and to be built at that port the present summer, will amount to 17,000 tuns, which is some 5,000 tuns more than was built last year.

We are indebted to Gen. Walbridge for a copy of his very able and interesting speech upon the Pacific Railroad Bill, delivered in the House of Representatives on the 13th inst.

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New Inventions.

Stone Drilling Machine.

The annexed engravings are views of a Stone Drilling Machine, for which a patent was granted to William C. Wright, on the 7th of last March. Figure 1 is a back elevation of the machine, and figure 2 is a sectional side elevation. The same letters refer to like parts. The nature of the invention consists in a certain arrangement and mode of operating two sets of grippers, whereby one set is caused to grip and carry up the drill bar, while the other set slides down the bar previous to renewing their grip, and the drill bar is liberated from both pairs of grippers, and let fall at the end of every upward movement. This arrangement allows the drill to strike two blows during every revolution of the driving shaft, and saves the time lost in raising the bar when only one set of grippers is employed, as one set is always rising and also gripping the bar, except during the short interval when the drill bar falls.

A A are two wrought-iron uprights, which are secured firmly to a base, B, of cast-iron or timber, and are stayed by a cross tie, C, near the top. At about the middle of the hight of the uprights, are secured the boxes, D D, which form the bearings of the horizontal driving shaft, E, which is furnished with cranks, by which rotary motion is given to it. At the top of the uprights are secured the boxes, F F, which form the bearings of two short shafts, G G′, which carry each a sprocket wheel, H, receiving rotary motion through an endless chain, I, from one of two sprocket wheels, J J, on the driving shaft. The two shafts, G G′, stand in line, and are furnished at their adjacent ends with two cranks, K K′, which stand on diametrically opposite sides of their common axis. The cranks are furnished with wrists, *f f′*, which enter slotted heads, L L′, at the top of the upright rods, M M′, whose lower ends are forked to carry the grippers, N N′, which seize the drill bar.

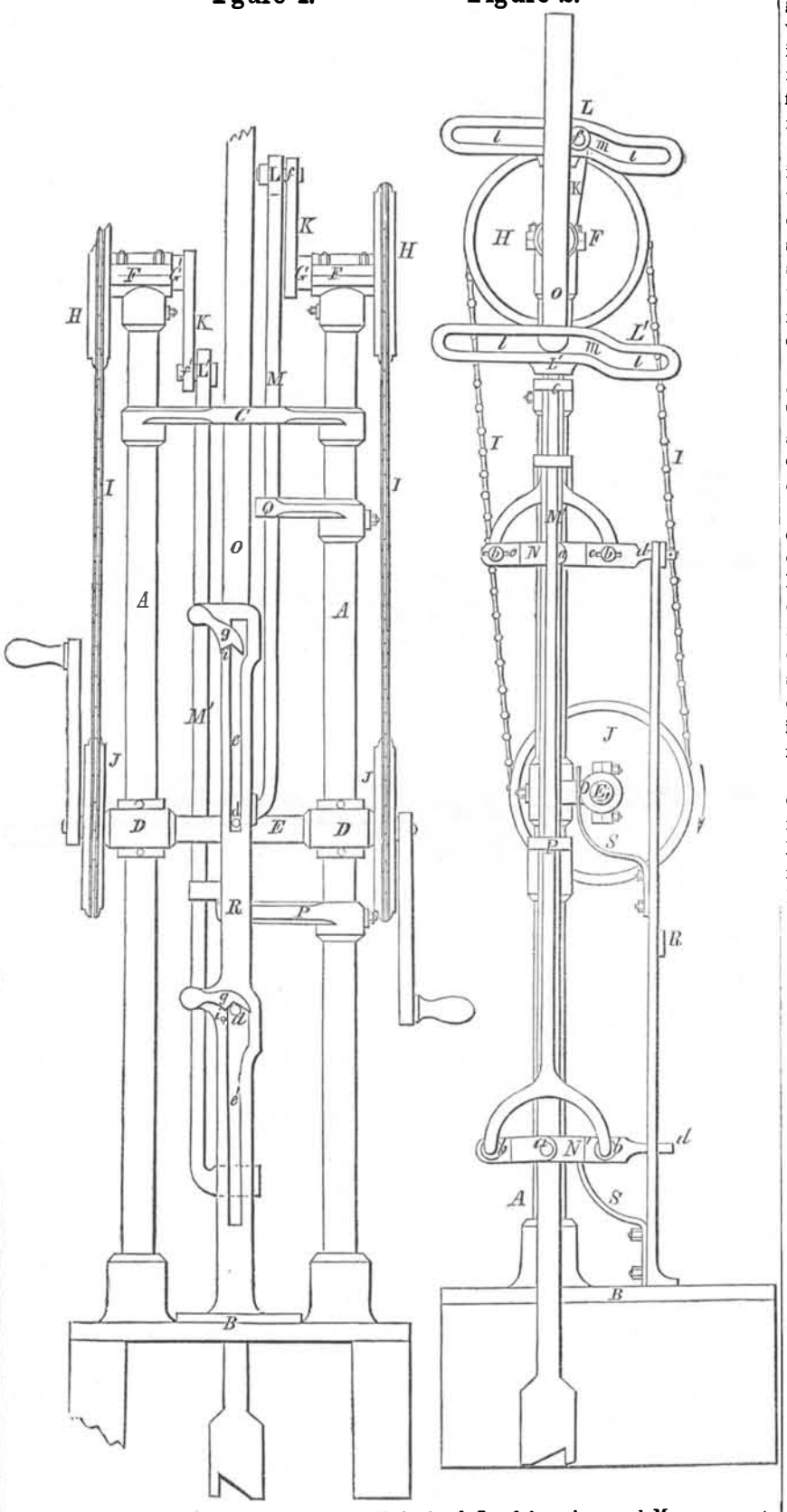
The drill bar, O, is parallel with the uprights, A A, and is placed midway between them, being fitted to work in two guides, one of which is in the cross tie, C, and the other in an arm, P, below. The rods, M M′, which carry the grippers, are on opposite sides of, and nearly close to the drill bar, and they work in guides in the cross tie, C, and in the arms, P, and Q, below. The rod, M′, is much longer than the other rod, M, as the grippers must occupy such positions that when the upper set have descended, and the lower set ascended, simultaneously, they will clear each other. The nippers are of a form substantially like some of the nippers in use for similar purposes, the two jaws being hinged together by lugs, *a a*, on opposite sides of the drill bar, and each jaw being suspended on a horizontal pivot, *b*, at the end of one prong of the fork on the rod. The jaws are made heavy at the ends, and are so formed that their weight makes them grip the drill bar when they hang free, but that when the ends are raised they will release the bar. The holes, *c c*, (see fig. 2,) which receive the pivots, *b*, of the fork must be elongated, in order to allow the grippers the necessary motion to grip and release the bar. At the back of the pivot, *b*, of the back jaw of each pair of nippers, is a shank, *d*, which passes through one of two slots, *e e′*, in a light upright standard, R, which is secured to the base, B, behind the drill bar.

The slots, *e e′*, in the standard, R, are of such length that they will allow the shanks, *d d′*, of the nippers to move in them as the nippers are raised and lowered by the revolution of the wrists of the cranks in the slots, L L′, at the top of the rods, M M′, but that each shank will strike the top of its slot just before the grippers arrive at the top of their upward stroke, and arrest its upward movement, after which the continued upward movement of the gripper rod causes the jaws of the grippers to be tilted up, and thereby opened to release the rod, which during their ascent they have gripped and carried up. The slots, *e e′*, are both straight for the greater portion of their length, and of a proper width for the shanks, *d d′*, to pass easily, but they are both curved outward on one side, and thus widened from a short distance below the top to the top, and on the opposite side of each is suspended by a pivot, *h*, a small arm, *g*, whose end rests upon a pin, *i*, which prevents its falling. The end of this arm is furnished with a hand or angle piece, which, when the arm rests on the pin, *i*, lays across the slot. As the shank of the grippers arrives opposite the widened part of the slot, it comes in contact with the hand of the arm, *g*, and as it continues ascending, raises the hand, which, moving in an arc, throws the shank laterally across the widened part of the slot. The grippers at that time holding the drill bar, continue to turn it until the shank strikes the top of the slot, and causes it to be released.

The slot in the heads, L L′, of the gripper rods, in which the cranks work to give the rods a reciprocating motion, consist each of two straight parts, *l l*, one a little above the other at right angles to the rod, united by a step, *m*, which is of the form of an arc, described with the radius of the crank. The arc-formed step, *m*, descends from the central

STONE DRILLING MACHINE.

Figure 1. **Figure 2.**



point in the slot, and allows the crank-wrist after having raised the rod to the highest position, by passing along the long straight part of the slot, to move in the slot for some distance before commencing to drive it downwards. The object of this is to leave the nippers, which have raised the bar, open, after having released it, for a sufficient time to allow it to fall. There are stop pieces, S S′, attached to the front of the standard, R, to open the grippers which have descended, and thus both sets of grippers are opened when the bar falls.

Suppose the drill bar to have just fallen, after having been raised by the upper set of grippers, N, as represented in figure 2. The wrist, *f*, of the crank, K, will be seen in figure 2, to be moving down the arc, *m*, of the slot in the head, L, of the gripper rod, M, consequently the rod is not moving. Both sets of grippers are open; the upper set in consequence of the shank, *d*, being depressed by the top of the slot, *e*, in the standard, R, and the lower set in consequence of the jaws being tilted by the stop, S′, on the lower part of the said standard. As the motion of the shafts and cranks continues, the first half of the revolution of the wrist of the crank, K′, will raise the gripper rod, M′, and the lower set of grippers, N′, and as soon as the said grippers are raised clear of the stop, S′, the jaws will fall of their own weight, and grasp the drill bar, whose friction and weight will draw them tight. In the mean time, the crank, K, after its wrist passes down the arc of the slot in the head, L, drives down the rod, M, and the upper set of grippers. The downward motion of these grippers on the rod, and the upward motion of the rod through them, both tend to prevent their gripping the rod, so they slide down easily. When the shank of the grippers, N′, reaches the hand of the arm, *g*, they raise it, and in ascending, this hand turns the drill bar by forcing the shank towards the widened or recessed part of the slot, *e′*, where it remains until the descent of the grippers. When the shank, *d*, reaches the top of the slot, and its upward progress is arrested, the grippers, N′, being opened, allow the bar to fall. The next half revolution of the cranks will cause the wrist of the crank, K, to raise the gripper rod, M, and grippers, N, which will raise the drill bar, while the wrist of the crank, K′, after descending the arc, *m*, of the slot in the head of the rod, M′, will force down the grippers, N′. Before either pair of grippers are opened, after raising the bar, the pair which have in the meantime descended, are also opened by coming in contact with one of the stops, S S′, on the standard, R, and these grippers remain open during the latter part of their downward stroke, and the early part of their upward stroke; this is necessary for the same reason that the descent of the nippers which have raised the bar, is for a time arrested, viz.: because if the nippers were not kept open and clear of the bar during its descent, the friction of the bar within them would draw them tight. The continued operation of the machine is but a repetition of that described, every revolution of the driving shaft giving two strokes to the drill bar.

The patent of this machine is in possession of the American Manufacturing Company, who construct and sell the machines, of which they have three sizes. No. 1 to drill a hole 7 in. diameter and 100 feet deep. No. 2 from 2 to 3 inches in diameter, and No. 2 is a small machine for getting out blocks of granite. It is a simple and good machine, not liable to get out of order, is easily worked and capable of drilling all kinds of stone—hard granite and soft freestone.

Any other information respecting it—price of machines or the sale of a part of the patent—may be obtained by letter addressed to James F. Whittemore, agent of the American Manufacturing Co., No. 39 State street, Boston, Mass.

Improved Loom Clasps.

The extensive cotton and woolen manufactories of this country have supplied a great amount of stimulus to inventive genius, which has caused a more complete revolution in the loom than in perhaps any other appliance of art. There is, doubtless, room for still further improvements, notwithstanding the many that have gone to swell the records of the Patent Office. One of the latest suggestions of improvement, in this line, is that of George Copeland, of Lewistown, Me., which proposes an improvement in the clasps of weavers' harness, by the arrangement of a couple of plates attached to the shaft. One of these is placed in front and the other back of it. These plates are to be supplied with teeth that pass between the heddles, on the lower or inner side of the shaft. The teeth are so suspended from the strap that its tension draws them towards each other, and causes the shaft to be confined between them. Though Mr. Copeland chiefly professes to have promoted cheapness and convenience by this mode of attaching the harness to the straps, and greater protection to the heddles, his claim has an importance inseparable from the modern importance of the weaver's craft.

Self-Feeding Metal Drills.

A great desideratum in this class of machines is the securing of a downward feed which shall be simultaneous with, as well as equal to its rapid motion and capacity. This James Conner, of Richmond, Ind., claims to have accomplished by an improved combination, which consists of the employment of a scroll cam in the gearing used in turning the drill stock. The inventor also claims to have simplified the machine in other respects, particularly in the manner of self-re-adjustment, the moment the metal is perforated.

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Scientific American.

NEW YORK, JULY 1, 1854.

Types of Mankind.

"The greatest study of mankind is man."

A new work bearing the above title has recently been published by Lippincott & Grambo, the enterprising Philadelphia publishers. It is of imposing dimensions, and illustrated with nearly four hundred engravings. Its authors are J. C. Nott, M. D., of Mobile, Ala., and Geo. R. Gliddon, late U. S. Consul at Cairo, Egypt, and well known to the public as the exhibitor of the "Panorama of the Nile," and the Mummy of the Egyptian priestess, which on being unrolled in Boston in 1850, turned out to be of an opposite sex from that represented. It also contains a paper by Agassiz, one by Dr. Usher, illustrated selections from the unedited works of the distinguished Dr. Morton, and a memoir by Prof. Patterson, of Philadelphia. The author of the memoir stigmatizes the venerable Dr. Bachman, of Charleston, S.C., because he opposed Dr. Morton's views, and takes occasion to accuse the great Humboldt of "popular declamation," all of which is in very bad taste. The object of this work is as much for the overthrow of Christian philosophy as anything else. This is admitted by one of the principal authors, in a manner not very creditable to himself. This book should be read and studied by every christian clergyman in the world, for if its deductions are true, the christian religion must be false. If its statements and deductions are not true, the sooner they are thoroughly exposed, so much the better for the sake of truth and science.

It is assumed in this work that mankind, contrary to the general belief, and the Bible, are descended from quite a number of original pairs—not one Adam and one Eve—but perhaps eight and perhaps two hundred Adams and Eves. From facts presented in it, however, and respecting which there is no dispute, we would come to the opposite conclusion of its authors. Agassiz divides mankind into a number of races, and distributes them geographically, placing a different human race with each different *fauna* (the animals of a country.) Thus he considers the Esquimaux race confined to the Arctic regions, at the head, and belonging to the fauna of that clime; the white man, (European type) as belonging to the temperate regions and their fauna; and the Malay, Negro, Australian, Mongul, &c., belonging to different fauna, which he divides in a map into eight races, at the head of which is placed—naturally indeed—his old preceptor, Cuvier. One singular fact, however, is presented and admitted by Agassiz, which in our opinion overthrows his whole theory, and that is, while he distributes a separate race of men for every fauna, and distributes these geographically over the American continent into at least twelve different *fauna*, he says, "among the tribes of man inhabiting this continent, and indeed the most extensive investigation of their peculiarities, has led Dr. Morton to consider them as constituting but *a single race* from the confines of the Esquimaux down to the Southernmost extremity of the continent." No better argument could be furnished against providing a distinct human race for every *fauna*, than this one furnished by Agassiz himself.

Agassiz asserts that the belief in mankind being descended from a common stock runs into the Lamarkian development theory—that is, that life commenced at a point, and developed itself into a man. We must say that his theory of classifying different races of men and fauna runs into the development theory, for the Lamarkian philosophy of the vestiges of Creation, does not set out from a *single point*, but many points of life, distributed over our globe, and by Agassiz's theory of the different man races and fauna, a powerful argument is afforded for the development theory.

If men have been created in different races, each as part of the fauna of a country, how can we account, by the laws of natural science, for the progress of different nations (also their retrogressions) and their radical changes socially and politically during their history? It is impossible. According to the many-type theory, the Anglo-Saxon race must now be fulfilling the conditions of the Lamarkian one,—because they certainly differ as much from their acorn and pork eating, naked and painted ancestors, as a citizen of our Republic from a Mongul. Agassiz, to reconcile his theory with logic and philosophy, must prove that the different races of men do not change, and never have changed, just as the fauna with which he classifies his different races of men, never have changed.

The style of Prof. Agassiz is dignified and unassuming; we cannot say so much for that of either Dr. Nott or Mr. Gliddon. They, however, present a great mass of very curious information, well worthy of careful study, especially the former editor. But as in the case of Agassiz, we would draw very different conclusions from the very information which they have presented, from those at which they have arrived. One great idea connected with this theory of the diversity of the human races, arising from facts presented in this work to prove that mankind existed when races of animals now extinct lived on the earth, is the totally opposite one which can be furnished to that of Hugh Miller, Lyell, and other eminent geologists, who believe that there were six great creative epochs, and that man was the last created, about 6,000 years ago. From the skeleton of an Indian found at New Orleans while excavating at the gas works, Dr. Nott concludes that the human race existed on the Delta of the Mississippi 57,000 years ago.

We anticipate a great war among the professors of natural science, from the publication of this book, and one respecting which no man should be ignorant.

We have only commented upon the single part of this work furnished by Prof. Agassiz, and may embrace future convenient opportunities to review parts furnished by the other authors.

The Cholera.

The news has already spread throughout the length and breadth of our land, that fifty-four fatal cases of cholera occurred in one week in this city. We would state that nearly as many deaths from consumption take place every week in New-York, and from circumstances connected with those fatal cases of cholera stated, we believe no fears need be entertained of it as an epidemic.

During the prevalence of the great cholera epidemic of 1832, Dr. Beck, of Rutgers College, was commissioned by Gov. Throop, of New York, to procure information concerning its origin, character, and progress, and the mode of its treatment. The question of contagion was then much agitated, and accordingly, Dr. Beck gave it his studious attention, by tracing the progress of the disease from its first appearance at Quebec, June 8th, through all its course to this city, where it broke out on last day of that month. It is not a little remarkable, that it appeared within twenty-four hours, in various towns and boats on the St. Lawrence river; and in Plattsburh, N. Y., in the case of an emigrant, who had been exposed to wet and cold, and had eaten voraciously just previous to the attack. The disease then appeared at once, in the most filthy part of that village, among irregular persons, who had no connection with the emigrant. In the State Prison at Sing Sing, N. Y., an insulated prisoner was taken with it on the 17th of June, and died in a few hours, and this before a single person was attacked in that village. After this some hundreds of cases occurred within the prison. This showed that contagion was out of the question, and yet many circumstances occurred tending to prove the contagious theory, such as the passage of the disease from place to place along the main channels of travel.

Throughout the whole extent of country visited, Dr. Beck found a general tendency to diseases of the stomach and bowels—caused, it is supposed, by a general epidemic constitution of the air, or in part by fear. The people are thus rendered peculiarly liable to attacks, and slight exciting causes produce the disease. Under peculiar atmospheric constitution, persons crowded together in boats or neighborhoods are specially exposed, particularly where they are either filthy, badly fed or clothed, or intemperate; and in these circumstances the disease may be excited by the effluvia of cholera patients.

It is a striking fact, not peculiar to cholera, but noticed in the history of every pestilence which has desolated the world, that persons whose constitutions have been broken down by intemperance, are among its first victims. In the cases of diseases which have prevailed among us, the evidences of this are too numerous and striking to be particularized. Indeed, in many places a large proportion of the fatal cases are among the unfortunate.

We have seen many receipts published of compositions for the prevention and cure of cholera; none of which can be relied on as specific. Cleanly habits, temperance in eating and drinking, an avoidance of excitement, exposure to high heat, and damp night air, and keeping the bowels in proper order, are the best preventives.

The most proper course to be pursued when a person takes this disease, is to keep him warm, by applying stoppered bottles, containing hot water, to his feet and other parts of the body, administering a simple rhubarb aperient, and sending for a respectable physician as soon as possible.

Foreign Patents.

There seems to be an increasing disposition among American Inventors to secure their inventions by Patents abroad, as it is generally admitted that a wider field opens in foreign markets for the introduction of good improvements than exists here, so little comparatively having been done there in this department, if we may except Great Britain. We believe it is very generally conceded that capital is more easily procured abroad for the purpose of developing and introducing inventions. This is in a great measure due to the more permanent character of their manufacturing interests, and the constant and pressing demands for something new. In some departments, especially, we are almost wholly dependent upon other countries for our supplies, and in consequence of the rivalry which exists among manufacturers, they are more prompt to introduce any real improvement into their business. Thus it is that a field is open, and under proper management our ingenious inventors stand a good chance of success. They must, as a matter of course, assume some risk, and we do not feel willing to urge them to take foreign patents without due consideration, and even some doubt of success which attends every enterprise in its incipient stage. "To risk nothing is to gain nothing," is the generally received maxim of successful men of business. Our agents in London, Paris, and other European cities, are responsible in every sense, and will usually undertake the sale of good patented inventions, and if parties have capital to invest in foreign patents, they can secure them through our agency, and introduce them through the assistance of our agencies in Europe. It must be understood, however, that untried inventions cannot be undertaken on sale—their character for utility must be established, and facilities for exhibiting them must necessarily be furnished. It is out of the question to sell a patent in Europe unless its value is clearly proved by operation.

Reform of the Patent Laws.

A Bill has been introduced into the Senate, by the Committee on Patents, for a complete re-modeling of the patent laws. It provides for an additional number of examiners and assistants, and the reduction of fees to foreigners. It also provides for the issuing of patents for five years, and for their extension for fifteen years, by the Commissioner, upon payment of an increased fee. It is believed that this Bill cannot be discussed during the present session, and most likely it may meet with the fate of the one which was before the last Congress—be buried in forgetfulness. We will endeavor to place the bill before our readers at some future time.

Steam Carriage for Common Roads.

Some of our cotemporaries state that the steam carriage of J. K. Fisher, made a trip one evening, recently, from 26th street, to Liberty street, in Broadway, this city, traveling at the rate of six miles per hour, on the boulder pavement, and twelve miles per hour on the Russ pavement. They also assert that the inventor thinks his experiment was entirely successful. If this experiment amounts to success, we must say that it has been very cheaply obtained, for the rate of its speed was less than carriages of the same character which were tried twenty years ago. When plank roads were first introduced into our country, we thought that such carriages might be usefully and economically employed upon them, but an examination of a number of plank roads in this State five years ago, and a comparison of them with railroads for public conveyance, dissipated every idea that we ever entertained respecting them for such purposes.

The Steamer Rotary.

Our readers will remember the illustrated description of the Rotary Engine of Ebenezer Barrows, of this city, on page 25, Vol. 8, "Scientific American," and a number of notices at various times, in the same volume, of the performance of his steamboat—"Rotary Experiment." This boat, which plied last summer between Newark and Bellville, N. J., has changed its name to the above (it is no more the *Experiment*) and has been ordered into the United States service. If this engine proves to be as economical during the next, as it has during the past year, we have no doubt but Mr. Barrows will receive an immense amount of orders to furnish his engines for every purpose that other engines are now used. It is so compact, and has hitherto done so well, that it may prove to be the long desired "Rotary Steam Engine."

Merchant and War Steamers.

Oliver Byrne, C. E., has published a communication in the "Courier and Enquirer," in refutation of the opinion of the Navy Department, that "our commercial steamships are not adapted for war purposes." He asserts that the "Arctic," (Collins Steamer) is stronger than the steam frigate "Susquehanna." If this is so, then it is, in one sense, better for naval purposes, as it possesses greater speed, and this is certainly a great advantage. But is the machinery and the boilers of our merchant steam-ships so placed and arranged as to make them safe vessels of war? This is the most important consideration of all. If the boilers are not under the water line, then a a single shot into one of them would be like a red-hot shot into a powder magazine. The boilers and machinery of our merchant steamers are not safely placed for their use as vessels of war.

Morse's Telegraph Patent.

The Commissioner of Patents has extended the patent of Professor Morse, dated June, 1840, for seven years. The eighth claim of Prof. Morse's patent, which was decided by the U.S. Supreme Court to be illegal, has been disclaimed, and the patent renewed, according to that decision. It has been stated that the extension met with strong opposition from parties interested in the House and Bain patents, but of this we have not yet any positive evidence.

Patent Office Report.

We are indebted to Judge Mason, Commissioner of Patents, for a printed copy of his report for 1853.

The claims of the patentees embraced in this document, were published by us weekly, during the year named; and the remarks and suggestions of the Commissioner, in connection therewith, have already been presented by us to our readers.

Tinning.

According to Becquerel, well-cleansed vessels of iron and copper may be tinned by dipping them into a solution of the double salt of chloride of tin and sodium, at the heat of 160 deg., assisted by moistening them first with a dilute solution of the chloride of zinc applied with a brush, or by dipping them into it.

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Recent Foreign Inventions.

Curing Croup in Hens, &c.—John Baily, of London, patentee.—This invention consists in forming pills of the following ingredients :—Powdered Jesuit's-bark, 2½ grains; powdered ginger, 2½; powdered rhubarb, 2½; sulphate of zinc, 1-10 of a grain, and water, 2 grains. This is divided into five parts, and one crammed down the throat of the ailing biped every two hours until a cure is effected.

To make Sea Water fit for Washing.—E. Heard, of London, chemist, patentee.—The inventor takes the common soda sold in shops, and roasts it in an iron pan until its water of crystallization is expelled. It must be kept stirred during the roasting to prevent it adhering to the iron. When dry, it is ground in a mill to a fine powder, and is then mixed with an equal quantity of sifted dry slacked lime. It is then in a fit state to be used for softening salt water by dissolving some of it in hot water, and then pouring the solution into the vessel containing the salt water. A sediment soon falls to the bottom; this is allowed to settle and the clear water poured off for use. The salt—soda and lime—to produce this effect is a simple caustic alkali.

Gilding Porcelain, Glass, &c.—William Cornelius, of London, patentee.—This invention relates to the preparation of the gold employed for the purpose described in the title. The inventor dissolves the gold in nitro-muriatic acid, and precipitates it by pure liquid ammonia (such as is commonly used by engravers,) and then washes and carefully filters the solution through an ordinary filter, and thus obtains a voluminous yellow metallic residuum, which, for the purposes of the invention, should be kept in a moist state with oil until it is required to be used in the manufacture of the gilding preparation. When used for such purposes he mixes the residuum with a corrosive mixture, composed of two parts of the finest rosin, and two parts of lac varnish, "and when the mass has been thoroughly mixed and incorporated together, and is perfectly dried, it is then entirely divested of its explosive property, by which it can be worked with safety; and this compound, when mixed with boracic bismuth, has been found to produce gilding of great solidity, but which requires slightly burnishing."

Separating Emery from other Matters.—F. C. Calvert, of Manchester, Eng., chemist, patentee.—This invention consists in agitating emery for some time, in a quantity of oil, pouring the latter off and then washing the oil away from the emery. The patentee describes several methods of removing oils and other impurities from emery, without diminishing its hardness. This is effected, in one of these methods, "by boiling it with a solution of caustic alkalies or their carbonates, or other metallic oxyds, such as those of lime, baryta, strontia;" but the patentee prefers employing a solution of caustic soda of a specific gravity of 0·015, the strength and quantity to be used varying, of course, with the quantity of oils or fatty matter which the impure spent emery contains. To facilitate the action of the alkali on the fatty matters, the whole is placed in a cast-iron boiler, and whilst being heated, either by steam or by the direct application of fire, the mass is kept in a constant motion by an apparatus consisting of a revolving perpendicular shaft, having an arm or arms projecting horizontally from it, or by some other agitator producing the same results. When the saponification is accomplished, the soapy liquor is run into a separate vessel, where it is mixed with a sufficient amount of acid to separate the fatty acids, which are then washed, and may be used for various purposes. A stream of water is then introduced into the vessel containing the emery, the agitator being all the time kept in motion, and, owing to the high specific gravity of the emery, the greatest portion of the impurities mixed with it are washed away.

Preserving Potato Seeds.—C. S. Jackson, of London, patentee.—This invention is to preserve potato and other roots to be used as seeds, and to prevent them from being injured by rot, fungus, or worms. To do this, a solution of the sulphate of zinc is made up, (about 1 lb. for 30 gallons water) and when cold the potatoes are steeped in it for a few minutes, then taken out, dried, and put past till spring, in a dry, cool place. This information may be very useful to many of our gardeners and farmers this year, in the preservation of choice seeds and roots.

Preserving Timber.—The same gentleman has secured a patent for the use of salts of zinc, alumina, and the muriate of ammonia, for preserving timber. The timber is steeped for some time in a solution of these salts, then taken out and dried in a warm room, or by exposure to hot sunshine. It is a good solution for the purpose, but will answer as well without the ammoniacal salt.

Collated from the "London Mechanic's Magazine," "Newton's Journal," and "Artizan."

Melting Point and Transformation of Sulphur.

Sir B. C. Brodie, F. R. S., read a paper on Sulphur, at a recent meeting of the London Royal Society—in the course of which he remarked that in the various treatises of chemistry, great discrepancies exist respecting the melting point of sulphur, so much so that he was led to make several experiments, with the view of discovering, if possible, the true laws which regulate the transformation of sulphur and its liquidation. The melting point of sulphur varies according to its allotropic condition. This condition is readily altered by heat, and invariably, without peculiar precautions, by melting. Hence the temperature at which sulphur melts is different from that at which it will solidify, or at which, having been melted, it will melt again. The melting point of the octohedral sulphur is 114·5°. But from the facility with which this sulphur, when heated even below its melting point, passes into the sulphur of the oblique system, this fact may readily be overlooked. When this sulphur, even in the shape of fine powder, is heated for the shortest time, between 100° and 114·5°, this change cannot be avoided. For the transformation of large crystals a longer time is required. At a certain point the crystals become opaque, and are often broken in pieces at the moment of the change. When sulphur has been converted by heating a sufficient length of time, it acquires a fixed melting point of 120°. This is the melting point of the oblique prismatic sulphur. If sulphur thus converted be carefully melted, so as to raise the temperature as little as possible above the melting point, no sensible difference will be observed between the point of melting and that of solidification. To obtain this fixed melting point of 120°, care must be taken that the transformation of the sulphur has been thoroughly effected. If this be not done, it may melt at any point between 114·5° and 120°. If, however, the temperature of the melted sulphur be raised above its melting point of 120° the point of solidification will be altered, and will lie even below the first melting point of 114·5°. The sulphur which is insoluble is bi-sulphide of carbon. This is prepared by extracting the hardened viscid sulphur with that re-agent, which has a melting point considerably above 120°, but which the author has not been able to determine with precision. It is stated in chemical treatises that the opacity, which on solidification comes over the melted sulphur, is due to the transformation of the oblique prismatic into the octohedral sulphur, and the consequent disruption of the crystal. To this cause is also attributed the evolution of heat, which has been observed in solid sulphur immediately after cooling. There are, however, no sufficient grounds for this view, and some of the observations are decidedly adverse to it. On extracting melted sulphur which had become opaque with the bi-sulphide of carbon, traces of insoluble matter were constantly found, even when the greatest precaution had been taken to avoid elevation of temperature, and this opacity appears to be due to the hardening of the viscid sulphur, and the consequent deposition of opaque matters in the pores of the crystals, which is quite sufficient to account for it. It remains, therefore, to ascertain the cause of the evolution of the heat; and on this point the author suggests that when the sulphur is tempered, the change takes place very slowly, and the heat evolved is not perceived. This view is confirmed by a fact that the viscid sulphur possesses another solid form. Sir B. C. B. has found, moreover, that when sulphur melted at a high temperature is suddenly exposed to intense cold, such as the cold of solid carbonic acid and ether, the sulphur formed is not viscid, but solid, hard, and perfectly transparent. When the temperature is allowed to rise to that of the air this sulphur becomes soft and elastic.

Freaks of Lightning.

Lightning has been often known to cut curious capers, but rarely have we observed a more singular example of its eccentricity than occurred at the house of Mr. Ellis, in Philadelphia, a few days ago. The "Philadelphia Ledger" says:

"It came down the chimney into the library, scattering the books in every direction, driving the plaster from one side of the room into the hard wall on the opposite side. It entered a large desk of clothing and silver ware, the lid of which was screwed down, burst the chest open in the centre, and knocked one end completely out of it. It descended into the closet, scattered and broke the crockery, tore the closed door off its hinges, and piled many of the utensils in the centre of the room. A tin pepper box was shown to us, which had a small hole in the side near the bottom, perforated as if by a buck shot, through which the lightning passed, melted the solder from the lid, and passed out at the top, throwing the lid into the centre of the room. The house had fourteen occupants in it, and not one of them was injured, and the children were not even wakened by the explosion. The sleeping room of Mr. Ellis was so filled with dust and the smell of sulphur, that he was nearly suffocated before he could open the doors."

[It is something singular and unaccounted for, that a sulphurous smell is always felt by those who have been in a house struck by lightning.

During severe thunder storms, we have heard many persons relate that they have noticed this offensive sulphurous odor. The only way that we can account for it, is the presence of ozone.

By passing a number of electric currents through a portion of the atmosphere, it is converted into ozone, and perhaps the lightning performs the same office, on a large scale, during thunder storms, that electric sparks do on a small scale, in the laboratory.

(For the Scientific American.)

Flying.

Absence from home prevented my seeing the reply of "J. W.," on page 243, until the present time. He says that "it *can* be demonstrated by known laws of mechanics that birds can fly." But in place of a demonstration he merely gives his views on the subject; and states that he drew them from the "Scientific American." Now he has read the "Scientific American" differently from what I have, if he has found any thing in it that inculcates the idea that a bird sailing above the earth in a breeze of wind, is affected any more by it than if it were in a dead calm. Or that it, when breasting the wind, would be lifted up as a kite would be when held by a string. Birds in a gale, were it not that they see the earth apparently moving below them, would be no more sensible of it than the passengers in a car moving forty miles an hour are of its progression. It is true, that after making a swoop to gain impetus, it will, by elevating its front, "mount up an inclined plane of air, as it were;" but from known laws of mechanics it could not mount so high as the point from which it took its swoop, any more than a railroad car turned loose at the top of an inclined plane, could be made to ascend another inclined plane, by its impetus alone, higher than its starting point. There are two forces operating that have continually to be overcome by birds while flying. The force of gravity tending to bring them to the earth, and the resistance of the atmosphere through which they move. The initial velocity alone would carry a bird forward but a few seconds before the resistance of the air would entirely stop its motion, and the force of gravity brings it to the earth; yet we observe the common vulture sail slowly through the air for many minutes without flapping its wings at all, or moving any slower, and yet mounting higher all the while.

If "J. W." will ascertain the velocity with which a bird moves, and its weight; he may, by taking the size of its wing and the distance and frequency of the flap, ascertain the mechanical force exerted against the air to impel the bird forward and sustain it in the air. If this should exceed the force of gravity and the resistance of the air, the bird flies mechanically, if not, it is possessed of some unknown power. By making the calculation it will be found that even pigeons do not exert a sufficient force with their wings to against the air to overcome the resistance of the atmosphere in their flight, and sustain them in the air against gravity.

If a vulture should start to sail through the air with a certain velocity, and neither have its front elevated or depressed, by the known laws of mechanics, gravity would bring it to the earth as soon as if it were not progressing at all; and if its front should be kept so much elevated as to make it move parallel to the surface of the earth, then the sliding up the inclined plane of air, which is all the while sinking under it, will arrest its progress in the same time that it would acquire its initial velocity by falling from rest in vacuo. This, with the common vulture, would be about two seconds. In fact it cannot be proven by the known laws of mechanics that a bird can sustain itself at the same elevation in the air without flapping its wings for three seconds of time; yet we often see them sustain themselves several minutes without moving a wing.

I asked for a demonstration, not an opinion.

Jackson, Tenn. J. B. C.

(For the Scientific American.)

To Purify Hard Water for Steam Boilers.

Make a cistern to contain as much water as the steam boiler which it is destined to supply, and set it, if convenient, over the boiler; divide it into four or more compartments connected together, and fill all but one with wood shavings. Then make a tight trunk, about 12 by 12, breadth and depth, but as long as the cistern, and place this on the top of the latter. The cold water for the supply is to be pumped into this trunk near one end, and it falls down into the cistern at the other end, into the first compartment filled with shavings. The exhaust steam from the engine, is passed by a pipe, through the trunk, and then through the cistern—out at the end of the latter—and will impart sufficient heat to boil the water. As the water falls from the trunk into the cistern below, it should be allowed to pass over the edge of the division of the first chamber, into the second, and under the second into the third, then over the third, and so on, to the last, from which it passes to the boiler. By this plan the lime is deposited among the shavings, and the water rendered so pure as to prevent trouble in the boiler, either from incrustations or mud. The water I use is of the hardest kind, yet by this arrangement I have run my mill for four months without cleaning out, and then found no lime and but little mud in the boiler. The shavings must be renewed occasionally. Yours, Nathan White.

Delphos, Tenn., June 11, 1854.

American Linen Factory.

A new linen factory has commenced operations at Fall River, Mass. The capital stock of the company is $500,000. The main building is of four stories, and 300 by 63 feet. The bleachery and store house of three stories, are about half as long. The number of spindles is 10,500; looms 250—when in full operation, about 500. The number of males employed is 130, females 160; when in full operation about five hundred persons will be employed.

A Great Bridge.

On the Illinois Central Railroad, there is a bridge erecting two thirds of a mile long, 75 ft. high, and contains upwards of 1,000,000 feet of timber. The top is to be covered with tin.

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LITERARY NOTICES.

NORTH BRITISH REVIEW—This able Review, for May, of the Free Church of Scotland, is just issued from the press of its enterprising American publishers, Messrs. Leonard Scott & Co., No. 79 Fulton st., this city. It contains eight excellent and profound essays on very interesting subjects. The first is on "The Plurality of Worlds," being a review of a work noticed in the columns of the "Scientific American" of last week:—a subject we shall endeavor to give more consideration at some future time. Another article on Auguste Compte and Positiveism, should be read extensively. A new volume of this Review commences with this number, and thus affords a very favorable time for persons to become its subscribers.

LITTELLS' LIVING AGE—The present number of this unrivalled weekly magazine, contains some of the most interesting articles we ever read: one article on the "Psychology of Opium Eating," is worth the whole price of the number. As the use of opium is fearfully on the increase in our country, this essay, by Dr. Harrison, of London, should be generally read. The next number of this work commences a new volume.

THE NEW YORK JOURNAL—P. D. Orvis, publisher, 135 Fulton street; monthly. Price $1,50 per annum; 12 1-2 cents per copy. We have read no literary periodical lately which has so much interested us, as a stray number of this magazine, which happened to fall into our hands the other day. It is beautifully illustrated with the finest of wood-cuts, and each number contains 58 pages of reading matter of the choicest selection. Any of our friends who may desire a rich monthly treat, in a literary way, at a small expense, will do well to send for this publication.

NATIONAL MAGAZINE—The July number of this excellent Magazine has made its appearance, and is profusely illustrated with scenes in Russia, accompanied with an interesting article descriptive of St. Petersburgh, and also of the habits and customs of the people. The articles on Martin Luther are continued, with engravings, forming an excellent series—in fact the entire number is good. This magazine is without a superior. Carlton & Phillips, 200 Mulberry street, New York, publishers.

OHIO CULTIVATOR—This useful agricultural journal continues to afford abundant evidence of prosperity, and is properly regarded as the leading authority in the great and prosperous State of Ohio, upon the topics which it discusses. It is really an excellent journal. Published monthly by M. B. Bateham, Columbus, Ohio. Terms $1 per annum.

FLORA LINDSAY—This is a new novel by that popular authoress, Mrs. Moody, of Canada: the publishers are Dewitt & Davenport, this city. It may be called a simple story, for there is no plot, nor grand romantic finale in it, only a simple account of the trials of an emigrant family during their preparation for and voyage from Britain to Canada. It is a well written work, but not equal to "Roughing in the Brush;" a work by thesame lady. Mrs. Moody is the sister of Agnes Strickland, historian of the Queens of England: she has another sister in Canada—Mrs. Vail—also an authoress.

TO CORRESPONDENTS.

J. B. R. N., of C——.—We have been told that ultramarine is manufactured in Philadelphia, but personally we do not know if this is correct.

J. D., of Pa.—If you have the information, give it. Theoretically, the piston arrives at and departs from both ends of the cylinder with the same velocity, that is, if it is a well made and proportioned engine.

T. J. B., of Penn.—We do not know the price of the paper roof, but we know the shingle one is the best.

N. W., of Tenn.—We believe you could not obtain a patent for your saw slide packing, although it appears to us to be a good improvement.

T. W., of N. Y.—Do not forget to give the name of your place of residence when you write again; and be sure not to use ape cil instead of a pen.

Mrs. D. P., of N. Y.—You can take a patent, and your husband will have no control of it. You hold it in your own right and your husband's assignment of the patent or any part of it, cannot effect your right in the least. The purchaser will be the sufferer—your husband has no right to assign your invention.

R. W., of O.—The use of slate slabs for hearth stones is not new, and if they had not been in use they would not be patentable.

B. R. E., of Me.—No doubt your mode of ventilating may be patentable, but we should advise you to experiment with it, to see that the result you claim for it is produced, and if you are satisfied you are not mistaken send us a model and the government fees.

F. W. C., of La.—We know of no machinery for making tin boxes of so large a capacity without soldering. Pill boxes are sometimes made by machinery without soldering, but we know of no machinery that would make boxes large enough for blacking.

J. C. A., of Pa.—There is nothing new in having two turbines on a shaft.

J. McC., of Pa.—A weak solution of sulphuric or muriatic acid, will remove incrustations from the boiler, but you must be very careful how you use it. These acids can be obtained at any druggist's, no peculiar composition is sold for incrustations. It will be a troublesome job to clean your six boilers. The acid should be mixed in a pailfull of water before you pour it into each boiler. It will take about two pounds for each boiler, which should be filled, heated up for half an hour, then emptied and when you fill up again for use, introduce one pound of soda crystals into each boiler to neutralize any action of the acid on the iron.

F. D. K., of Texas.—If you build a milk house with double walls and roof, that is, have an open space between the outside clapboards and the inside boarding, and fill up that space with dry saw dust, you will have a good cool house. A draft cannot be caused by a chimney unless there is a difference of temperature between the stratum of air at the bottom and the top of it, so that the hight of the chimney has nothing to do with the current. The milk house should be partly sunk in the ground, and ought to be situated so as to drain off water from the floor.

G. S., of Pa.—You know that a deduction of from 20 to 25 per cent. is made from the nominal for the actual horse power of an overshot wheel. So far as it relates to your gearing, we have never seen a rule to calculate the amount lost by friction according to the gear. The only test of power is the brake. We would prefer to get up the speed by employing a medium gear rather than mesh a small pinion with a large wheel to get up the speed on the shaft of the former.

C. R., of N. Y.—The best form of screw for a propeller on the canal is the common submerged propeller. If it has a diameter of two feet you can give it 100 revolutions per minute, but be content with fifty. We have already seen two propellers tried on the canal, and do not know why they are not now in use.

W. B., of Mass.—Your plan respecting the fire engine air chamber, is not equal to the one which has been tried by an acquaintance of ours—namely, to have an elastic air-tight diaphragm between the water and the air.

J. H., of Ill.—Yours has been received.

T. R., of Vt.—Your invention is a very good one, and is patentable, we believe.

S. M. H., of Ky.—Send on a better description of your invention. Write plain and clear, and do not use too many words.

R. R. W., of Ohio.—Your curved buckets are quite common, it is a wonder that you have not seen the like before.

Money received on account of Patent Office business for the week ending Saturday, June 24:—

D. K., of Ind., $25; M. I. C., of N. Y., $30: C. & B., of O., $25; G. B R., of N. Y., $30; J. L., of O., $25; A. F., of Pa., $25; W. H. A., of Wis., $10: W. G., of N. Y., $30; E. L. N., of Mass., $30: E. M., of Va., $30; D. H., of Ct., $44; W. H. H., of Pa., $55; H. W. W., of N. Y., $30; W. G., Jr.. of N. Y., $30: J. C., of Ind., $25; B. & C., of Mass., $60; J. B., of Pa., $32; W. T., of Ct., $30; E. T. L., of Va., $10; A. M., of Ind., $25; W. J. S., of N. Y., $55; L. J. W., of N. Y, $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, June 24:—

E. B. T., of N. H.; D. K., of Ind.; C. & B., of O.; M. I. C., of N. Y.; C. R., of Ga.; A. F., of Pa.; J. I., of O.; G. R. W., of Ct.; J. C., of Ind.; J. A., of Pa.; G. O., of Ct.; C. T. P., of N. Y.; A. M., of Ind.; D. H., of Ct.; E. A. H., of Ill.; J. B., of Pa.

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American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express, or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

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128 Fulton street. New York.

EUROPEAN PATENTS.—MESSRS. MUNN & CO. pay especial attention to the procuring of Patents in foreign countries, and are prepared to secure patents in all nations where Patent Laws exist. We have our own special agents in the chief European cities; this enables us to communicate directly with Patent Departments, and to save much time and expense to applicants.

PALMER'S PATENT LEG—"The best appliance ever invented." Pamphlets containing the testimonials of the first American and European surgeons, and other information concerning this invention sent gratis to all who apply to PALMER & CO., Springfield, Mass.: or 376 Chesnut st, Philadelphia. 42 13*

LEONARD & WILSON—No. 60 Beaver st, and 109 Pearl st, have constantly on hand and for sale a full assortment of Machinists' and Carpenters's Tools, embracing every variety of Engine and Hand Lathes, Iron Planing Machines, Mortising and Tenoning Machines, Wood Planers, &c. Also, Leather Belting of all sizes made of the best oak tanned butts, stretched on powerful machines, riveted and cemented. 42 13*

IMPORTANT—To Machinists and Mathematical Instrument Makers. An application for a patent is on file for an attachment to Gear Cutting and other Dividing Engines, by means of which the circle may be accurately divided into any desirable number of equal parts. Persons wishing to use such an attachment, or to become otherwise interested in the right, will receive further information by addressing, post-paid, P. O., box 116, Worcester, Mass. WM. H. BROWN. 42 4*

MATHEMATICAL,—Optical, and Philosophical Instruments. Our priced and illustrated Catalogue furnished on application, and sent by mail free of charge. McALLISTER & BROTHER,
42 4 Opticians, 48 Chesnut st, Philadelphia.

PATENT RIGHT FOR SALE.—We are ready to dispose of the Patent Right, (or any part of it) of the best Stone Drilling Machine now in use, or we are prepared to furnish working machines at very reasonable prices, these machines will drill from 1 to 7 inches in diameter, and 100 feet deep, and can be worked by Hand, Horse, or Steam Power, one machine performing the work of twenty-five men. For further particulars and circulars with cuts address JAS. T. WHITTEMORE, Agent American Manufacturing Co., 39 State street, Boston. 40 tf

CARPENTER & PLASS—Having removed their Works to the foot of 30th street, East River, N. Y., and enlarged their facilities for manufacturing Machinists' Tools, are now prepared to supply unlimited orders at shortest notice, alway guaranteeing a superior article. Terms moderate. 41 2*

NOVELTY IRON WORKS—Manufacturing of Machinists' Tools: also Engine Lathes, with an improved Tool Rest, Lathes, and Iron Planers kept on hand: for sale by W. W. NICHOLS & CO., cor. B and Turn pike street, Boston, Mass. 41tf

MACHINERY.—S. C. HILLS, No. 12 Platt-st., N. Y. dealer in Steam Engines, Boilers, Iron Planers Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's, and Law's Planing Machines; Dick's Presses, Punches, and Shears; Morticing and Tennoning Machines; Belting; Machinery Oil, Beal's Patent Cob and Corn Mills; Burr Mill and Grindstones; Lead and Iron Pipe, &c. Letters, to be noticed, must be post-paid. 27tfeow

PORTABLE STEAM ENGINES—The subscriber is now prepared to supply excellent Portable Engines, with Boilers, Pumps, Heaters, etc., all complete, and very compact, say 2, 2 1 2, 3, 4, 6, 8, and 10 horse-power, suitable for printers, carpenters, farmers, planters, &c., they can be used with wood, bituminous, or hard coal; a 2 1 2 horse engine can be seen in store, it occupies a space 5 feet by 3 feet, weighs 1500 lbs., price $240; other sizes in proportion. S. C. HILLS.
25eotf Machinery Agent, 12 Platt st, N. Y.

UNITED STATES PATENT OFFICE,
Washington, June 19, 1854.

ON THE PETITION of George Draper, of Milford, Massachusetts, praying for the extension of a patent granted to him on the 28th of October, 1840, for an improvement in "rotary temples for looms," for seven years from the expiration of said patent, which takes place on the 28th day of October, 1854—

It is ordered that the said petition be heard at the Patent Office on Monday, the 16th of Oct. next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing. All testimony filed by either party, to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 6th of Oct.; depositions and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the argument, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Evening Argus, Philadelphia, Pa.; Scientific American, New York; and Post, Boston, Massachusetts, once a week for three successive weeks previous to the 16th day of Oct. next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S—Editors of the above papers will please copy, and send their bills to the Patent Office, with a paper containing this notice. 42 3

UNITED STATES PATENT OFFICE,
Washington, June 5, 1854

ON THE PETITION of Frederick J. Austin, of New York, praying for the extension of a patent granted to him on the 16th June, 1841, ante-dated December 16th, 1840, for an improvemement in "machines for cutting paper and trimming books," for seven years from the expiration of said patent, which takes place on the sixteenth day of December, eighteen hundred and fifty-four.

It is ordered that the said petition be heard at the Patent Office on Monday, the 4th of December next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 24th of Nov.: depositions, and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York; Daily Courier, Buffalo, N. Y., and Post, Boston, Massachusetts once a week for three successive weeks previous to the 4th day of Dec. next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 40 3

IRON HILL SIDE PLOWS—The subscribers hereby give notice to all whom it may concern, that they are the assignees of Harrison & Metcalf (patentees of the above-named Plow,) embracing the States of New York, Connecticut, Massachusetts, Vermont, and New Hampshire; we expect to pass through those States and exhibit a model of our plow, and will be prepared to sell either State, County, or district rights to make and use it, as this plow possesses three advantages over all others in use—strength, durability, and simplicity; it only needs to be examined—it will recommend itself, for side-hill work and road making, and also works well on flat land. Patented Oct. 11, 1853.)
41 2* N. & I. KUYKENDALL, Albany, N.Y.

FOR SALE—The Crescent Foundry and Machine Co. have nearly finished a large Lathe, heavy and substantial, which swings 7 feet 8 inches over the ways, has 19 feet length of bed, and weighs about 13 tuns.
Bridgeport, Ct., June 14, 1854. 41 2*

RE-SAWING MACHINE—Myers & Eunson's Patent for cutting thin stuff from 1-16 to 3-4 inch of regular thickness out of merchantable lumber. One of said sawing machines is running constantly at 34 Bethune st, in this city, and can be seen at any time. The attention of persons interested in the business is called to the quality of its work. For rights apply to R. G. Eunson, 551 Broadway. 41tf

PATTERNS—For Castings and Models for the Patent Office made to order at the pattern shop of the Peck Slip Foundry, Williamsburgh, L. I., near the ferry.
41 3* WM. ARCHER.

T. M. CHAPMAN'S PATENT SAW FILING Machine. The best known and without a rival. The subscriber offers for sale Territorial Rights, and also builds and sends machines wherever they may be wanted. T. M. CHAPMAN, Patentee, Old Town, Me.
40 10*

FOR $1000 EACH—An assignment will be made, (or security given therefor) of one third the rights patent for England and France, of a breech-loading and self-priming rifle, preventing escape at the breech, simple and durable arrangement and construction, and capable of one shot in five seconds, or one hundred in twelve minutes. U. S. Patent applied for. Address J. C. DAY, Hackettstown, N. J. 39 5*

MACHINISTS TOOLS—Power Planers 4 to 16 feet long, weight 1,000 to 10,000 lbs. Engine Lathes, 6 to 19 feet long, weight 1,700 to 8,400 lbs., swing 21 to 38 inches. Hand Lathes, Gear Cutters, Drills, Bolt Cutters, Slide Rests, Chucks, &c., of best materials and workmanship constantly on hand, and being built, also the best Grain Mills in the country, "Harrison's Patent." For cuts giving full description and prices address NEW HAVEN MANUFACTURING CO., New Haven, Conn. 38 tf.

BRASS FOUNDRY FOR SALE—On easy terms, having a good share of business, and a fine location. For further information address box 905, Detroit, Mich. 38 5*

WOODWORTH'S PATENT Planing, Tonguing, Grooving Machines.—Double machines plane both sides, tongue, and groove at one and the same time, saving one half of the time when lumber is required to be planed on both sides. Large assortment constantly on hand. Warranted to give entire satisfaction to purchasers. JOHN H. LESTER,
37 13* 57 Pearl st. Brooklyn, L. I.

THE CRESCENT FOUNDRY & MACHINE CO. Bridgeport, Conn., make to order Stationary Steam Engines from 8 to 150 horse power, large double acting Force Pumps for water works, Iron Planers, Engine Lathes built in the most substantial manner and UNCOMMONLY HEAVY. Machinery in general and all kinds of Steam Boilers. Having a large and extensive stock of mill gearing and other patterns, the accumulation of 18 years, they are prepared to furnish castings at short notice. Any work ordered from this Company will be guaranteed equal to any made in this country. They would call attention to a large lathe which they build, designed for Railroad Machine shops for turning of drivers. They also make a very large and heavy lathe with screw feed, designed for Machine Shops in general. They are now making a vertical Engine of new design from 8 to 10 horse power, which will require but the small space of 4 feet square (the bed being 3 4 by 34 inches) and with a vertical boiler will require only 4 feet by 8 feet.
18 12 1am 1y*

STAVE AND BARREL MACHINERY—HUTCHINSON'S PATENT.—This machinery, which received the highest award at the Crystal Palace, may be seen there in operation during the ensuing season. Cutting, Jointing and Crozing Staves and Turning Heads. Staves prepared by this process are worth to the cooper from 20 to 40 per cent more than when finished in another way. Applicable alike to thick and thin staves. Apply to C. B. HUTCHINSON & CO., Auburn, N. Y., or at the Crystal Palace. 34tf

KENTUCKY LOCOMOTIVE WORKS—Corner of Kentucky and Tenth streets, Louisville, Ky.—The proprietors of the Kentucky Locomotive Works would respectfully inform Railroad Companies and the public generally, that, having completed their establishment, they are now prepared to receive and execute orders with fidelity and dispatch. They will contract for Locomotives, Passenger, Baggage, Freight, Gravel, and Hand Cars, of every style and pattern, as well as all kinds of Stock and Machinery required for railroads. Particular attention will be paid to Repairing, for which they have every facility. They are also prepared to contract on favorable terms for building all kinds of Machine Tools, such as Turning Engines, Lathes, Planers, Drills, Slotting, Splining, and Shaping Machines of every variety of pattern. Having also a large Foundry connected with the establishment, orders for castings are solicited, and will be filled with promptness. Car Wheels of any pattern can be furnished on short notice. Double and single plate and Spoke Wheels of all sizes constantly on hand. Communications or orders must be addressed to OLMSTED, TENNEYS & PECK, Louisville, Ky. 40 6m.*

PIG IRON—Scotch and American; also English Boiler Plate and Sheet Iron, for sale at the lowest market prices, by G. O. ROBERTSON, 135 Water st. cor. Pine, N. Y. 40tf

JOHN PARSHLEY, No. 5 and 7 Howard st., New Haven, Ct., manufacturer of Machinists' Tools, and Steam Engines, has now finishing off 25 Engine Lathes, 6 feet shears, 4 feet between centers, 15 inches swing, and weighs about 1100 lbs. These Lathes have back and screw gear, jib rest, with screw feed, and the rest is so arranged that the tool can be adjusted to any point the work may require, without unfastening the tool, hence they possess all the good qualities of the jib and the weight lathe; they are of the best workmanship. Price of Lathe with count shaft and pulleys, $155 cash. Cuts, with full description of the lathe, can be had by addressing as above, post-paid. Also four 30 horse power vertical Steam Engines with two cylinders. Price of engine with pump and heater, $800 cash. For particulars address as above. 35tf

$100 REWARD—To the Manufacturers of Bank Note Paper. The Executive Committee of the Association of Banks for the Suppression of Counterfeiting, hereby offer a reward of One Hundred Dollars for the best specimen, in the opinion of the Committee, of Bank Note Paper, of not less than five hundred sheets, which may be submitted to them on or before the 1st day of January next. All paper submitted, except that selected by the Committee, to be returned to the persons submitting the same.
J. M. GORDON, Secretary.
Boston, Mass., March 31 1854. 31 15*

FULTON FOUNDRY AND MACHINE WORKS S. W. corner of Green and Morgan streets, Jersey City, N. J. The subscribers are prepared to contract for Sugar Mills and Mining Machinery of every description. Horizontal Steam Engines of various sizes constantly on hand. All orders executed with promptness.
34 13* FIELDS, BROTHER & CO.

ENGINEERING—The undersigned is prepared to furnish plans for ever description of machinery, water wheels, turbines, and to consult with parties to make experiments and scientific investigations, and to superintend the construction of works. Agent for Mellier's Patent for making White Paper from Straw.
VICTOR BEAUMONT,
33 10* Consulting Engineer, 74 Broadway, N. Y.

FOR SALE—By the Baltimore and Ohio Railroad Co., 24 Crate Cars, adapted to railroad purposes, which will be sold at a reasonable price. For further information apply to SAMUEL J. HAYES, M. of M., Baltimore and Ohio R. R, Co., or BRIDGES & BRO., 64 Cortland st., New York. 34 tf.

NORCROSS' ROTARY PLANING MACHINE. The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringement of the Woodworth Patent.

Rights to use N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
208 Broadway, New York.

The printed Report of the case with the opinion of the Court can be had of Mr. Norcross. 36 tf

MACHINERY FOR SALE—The following machines are for sale at the "Scientific American" Office:—Alcott's Concentric Lathe, price $25.
Portable Mortising Machine, $20
Bushnell's Iron Drill, $25
All orders should be addressed (accompanied with the cash) to MUNN & CO., 128 Fulton st., N. Y.

WHITE STRAW PAPER—For Newspapers.—A Mellier, the patentee, having established his process at Nixon & Xeinour's Mills, Manayunk, where the paper for the Philadelphia Ledger has been made daily from straw since the 12th of April, is now ready to sell licenses and make arrangements for establishing the process elsewhere. Apply to A. MELLIER & V. BEAUMONT, 74 Broadway, where specimens of half stuff, stuff and paper may be seen. 33 10*

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic, Self-adjusting Conical Packing, Faber's Water Gau e, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc., etc.
CHARLES W. COPELAND,
35 tf Consulting Engineer, 64 Broadway.

PLANING, TONGUING, AND GROOVING—BEARDSLEE'S PATENT.—Practical operation of these Machines throughout every portion of the United States, in working all kinds of wood, has proved them to be superior to any and all others. The work they produce cannot be equalled by the hand plane. They work from 100 to 200 feet, lineal measure, per minute. One machine has planed over twenty millions of feet during the last two years, another more than twelve millions of of feet Spruce flooring in ten months.. Working models can be seen at the Crystal Palace, where further information can be obtained, or of the patentee at Albany, N. Y
27tf GEO. W. BEARDSLEE.

STATIONARY STEAM ENGINES—The subscriber is now prepared to furnish, with or without pumps, boilers, &c., Horizontal Engines on iron bed frames, good strong, substantial, plain finished engines that will do good service, say from 4 horse, $215, to 30 horse, $1,037: they have Judson's patent valves, and will be warranted to work well. S. C. HILLS,
31tf 12 Platt st, New York.

A. B. ELY, Counsellor at Law, 52 Washington street, Boston, will give particular attention to Patent Cases. Refers to Messrs Munn & Co., Scientific American.
16 1y*

SEWING MACHINE—The Office and Warerooms of the Wheeler & Wilson Manufacturing Company, for the sale of their Sewing Machines, is removed to No. 343 Broadway, where the public are invited to call and examine them in practical operation. 31 13*

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Scientific Museum.

Dammara Varnish.

The following article is from a recent member of the Polytechnisches Centralblatt, by Prof. W. Munzel, and possesses no small amount of interest for a large number of our readers :—

"If dammara resin be dissolved in cold oil of turpentine, a milk-white turbid varnish is obtained; this turbity however does not depend upon the incomplete solution of the resin, but rather upon the moisture adherent to it. This moisture, as well as the moisture enclosed in the interior of the resin, especially in the white opake pieces, produces many defects in the varnish, as when it is prepared cold this water remains in it in a finely-divided state. When such a varnish as this is laid on, the water contained in it, although in such small quantity, can neither evaporate nor soak into the varnished object; and thus these minute water-bubbles produce a dull, rough appearance on the surface of the varnish, so that the latter can never produce a truly glass-like coating. At every change of temperature, these watery particles either expand or contract, until at last, from frequent repetition of this process, or in consequence of a greater elevation of temperature than usual, the coat of varnish bursts or cracks, and falls off as a scaly powder. In order to get rid of this defect entirely, the water adherent to the resin must be completely removed. This is best done by boiling the resin with the oil of turpentine in an open vessel, as in this case the water enclosed in the resin is dissipated below the boiling point of the oil. The object is equally attained when the resin is well dried in a drying oven before solution, and then dissolved in cold oil of turpentine; if the resin were sufficiently dried, a perfectly clear transparent varnish is obtained, possessing all the properties of a good varnish; this mode of preparation, however, from its complicated nature, is not to be recommended for adoption on a large scale. If a very small quantity of water be added designedly to a perfectly clear and well-boiled varnish, and the whole is shaken, the latter immediately acquires the turbid appearance, and all the properties of a bad varnish.

In the preparation of dammara varnish, the author employs enamelled cast-iron pots, capable of containing about 50 lbs.; in these, 25 to 30 lbs. of varnish may be conveniently prepared. The dammara resin is put into the pots in a solid state (the powdering of the resin is disadvantageous, as when in this state it forms a mass during the fusion, and the varnish thus generally acquires a color), the proper quantity of turpentine (5 parts to 4 parts of resin) is then poured to it, and the whole put upon the fire. As soon as the boiling of the oil begins, the water originally included in the resin is dissipated in the form of vapor, and the resin acquires a softer consistence. When all the water is expelled and the oil (or varnish) boils quietly, the solution is completed, and the vessel may be removed from the fire. As long even as traces of water exist in the varnish, its boiling is attended with a bubbling movement; but as soon as all the water is got rid of, the varnish boils quite quietly. That even a very small quantity of water is sufficient to produce this bubbling, may be shown by blowing with the mouth into some quietly-boiling varnish, when the mass immediately appears ready to boil over, entirely in consequence of the slight moisture introduced into it by the breath.

When the varnish is prepared, it is poured thrrough a fine wire seive, and then allowed to settle sufficiently.

By this method, two workmen in the author's factory prepare 4-5 cwts. of good varnish per day.

If it be desired to give the varnish a tougher consistence, 2-3 per cent. of good bleached linseed oil (not boiled with oxide of lead) must be added to it before boiling. This communicates great toughness to it, and it then resists friction, &c., much better."

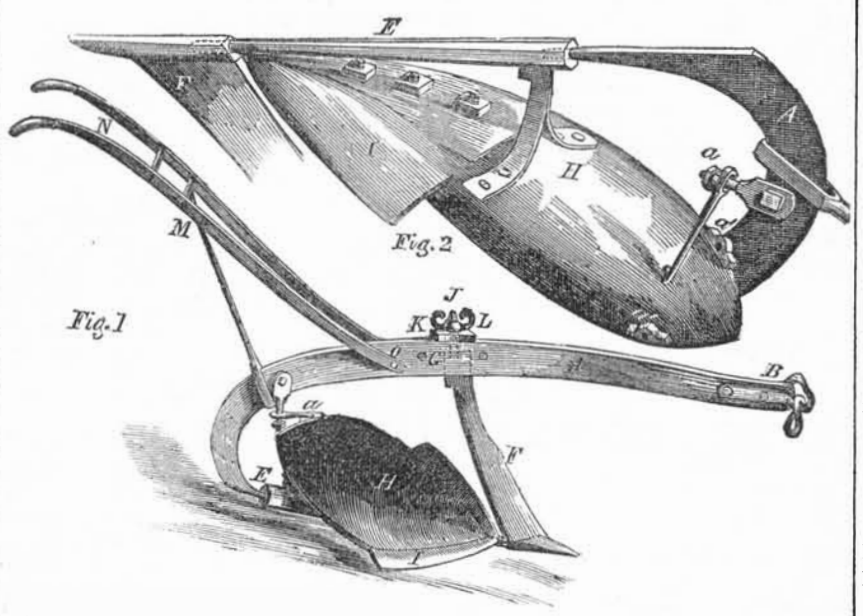
Great Musical Concerts have been held during the past two weeks in the Crystal Palace.

Appearance of the Earth from a Balloon.

Mr. Elliott, the aeronant, in a letter giving an account of his last ascension from Baltimore, says of the appearance of the earth from a balloon:

"I don't know that I ever hinted heretofore that the aeronaut may well be the most sceptical man about the rotundity of the earth.—Philosophy imposes the truth upon us, but the view of the earth from the elevation of a balloon is that of an immense terrestial basin, the deeper part of which is that directly under one's feet. As we ascend, the earth beneath us seems to recede—actually to sink away, while the horizon gradually and gracefully lifts a diversified slope, stretching away further and further to a line that, at the highest elevation, seems to close with the sky. Thus, upon a clear day, the aeronaut feels as if suspended at about an equal distance between the vast blue, oceanic concave above, and the equally expanded terrestial basin below."

IRON HILL-SIDE PLOW.



The annexed engravings are views of an improvement in Side-hill Plows, for which a patent was granted to Nathan Harrison and John W. H. Metcalf, of Ridgeville, Virginia, on the 11th of last October.

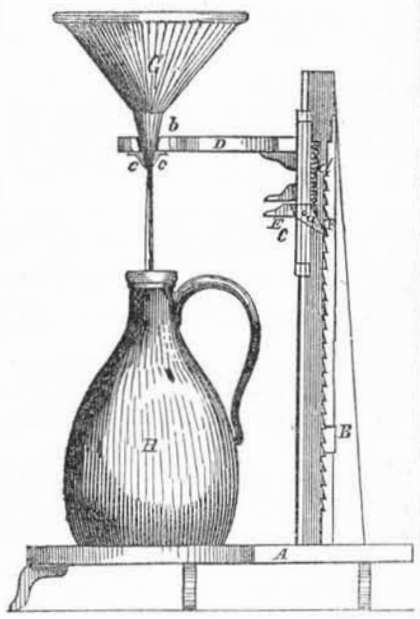
Figure 1 is a perspective view, and fig. 2 is a view of parts of the plow in an inverted position The same letters refer to like parts.

All the parts of this plow are made of wrought iron except the mould-board, which is cast. A is the beam; it is made of a bar of iron from 3-4 to 7-8 inches thick, and from 2½ to 4 inches wide—but it may vary in thickness according to the work it is intended to perform. This beam is nearly straight for about four feet from the clevis, B, and then curves to nearly a semi-circle, and is formed into a pivot point at the land side, fig. 1, E, where it fits into a socket at the hub of the land side. A plate, G G, is riveted or bolted to the beam, and forms a socket for the coulter, F, to pass through, which latter is bent sideways to make it range with the center of the beam. In the hub of the coulter is a socket for the point of the land side of the plow to turn in. A double share, I, is screwed to the mould-board. It may be made of such length and width as will be required, and can be made to turn a wide or narrow furrow, by lengthening or shortening the iron that attaches the heel to the land side, and the hook, *a*, that keeps the mould-board in place. The land-side, mould-board, and *share* being all firmly attached together, revolve on the pivot of a journal of the beam and in the socket of the coulter, so as to move over the mould-board and share, from side to side, and turn over a furrow in the same direction—to the same side—while the team is moving up and down, backwards and forwards, from head-rig to head-rig of the field which is being plowed. A screw, J, is cut on the top of the coulter shank and a washer and nut, K L, keep it firm in its socket, and serve to arrange the pitch of the plow to run deep and shallow. N are the handles or stilts, and M is a rod extending to the beam, and has a hasp, which slips over it, forming a clasp which is keyed to the beam, and can be fixed at various parts on the curve of the latter, to raise and lower the handles which are fastened on an axis pin, O, in the beam. The lugs *a' a'*, have holes in them for the screw bolt to secure the mould-board to the land side on both sides, when revolved from one side to the other, to turn a furrow. All the parts of this plow are strong, and durable—not liable to get out of order, and so simple that any country-blacksmith can make such plows.

The assignees of the patent for this region of the States are N. & I. Kuykendall, of Albany, N. Y., whose advertisement will be found on another page.

Filling Bottles.

The annexed engraving is a side view of an improved device for filling bottles, invented by Leonard W. Cheney, of Chelsea, Suffolk Co., Mass., who has applied for a patent. The nature of the invention consists in securing a funnel, through which the liquid passes into the bottle or jug, in an adjustable arm, for the purpose of allowing the funnel to be placed some distance above the mouth of the vessel to be filled, and thereby cause the liquid to enter the vessel in a small stream and permit the air to escape from the vessel while being filled.



A represents a platform or base on which are placed two vertical guides, B, between which a frame, C, works, one guide only is shown, the guide nearest the eye being removed. D is a horizontal arm attached to the frame, C, and E is a pawl secured to the frame, C, by a pivot, *a*, the lower end of the pawl catches into a vertical rack, F, between the guides and spiral spring, *d*, attached to the pawl, and the frame, C, keeps the lower end of the pawl in the rack. Near the outer end of the arm, D, there is a circular opening, *b*, having two springs, *c c*, underneath it the lower ends of which touch each other. The springs, *c*, may be made of flat steel strips, having their upper ends secured to the under side of the arm, D, as shown in the engraving. G is a funnel, the tube of which is inserted in the opening, *b*, in the arm, D. The springs, *c c*, press against the tube and secure the funnel properly in its place.

H represents a jug or vessel to be filled. The vessel is placed upon the platform or base, A, the mouth being directly under the end of the funnel, which is elevated some distance above the mouth as shown in the engraving.

The liquid when poured in the funnel descends from the tube thereof into the mouth of the vessel in a small stream, compared of course to the size of the tube, and the air is allowed to escape from the vessel while the liquid is passing into it.

The present practice is to place the tube of the funnel within the mouth of the vessel and pour the liquid into the funnel, the air is therefore prevented from escaping from the vessel and great inconvenience is experienced in filling vessels with thick liquids, such as molasses, etc., as the air within the vessel prevents the free escape of it from the funnel.

The funnel, it will be seen, is raised or lowered to suit different sized vessels by throwing the pawl, E, free from the rack, F. The pawl retaining the frame, C, and arm D, at the desired point.

The device may be constructed of wood or metal, either or both being used, and they may be made of various sizes.

More information may be obtained by letter addressed to the inventor.

Minot's Ledge Lighthouse.

A minute survey of these dangerous rocks has just been completed for the U. S. Lighthouse Board, by W. A. Williams, C. E.

The base of the outer Minot rock will permit the construction of a stone lighthouse of sufficient dimensions to resist the force of the most powerful wave, and it is expected immediate measures will be taken to commence the work. This is of the utmost importance to the commercial community, as several vessels have touched upon this dangerous ledge since the destruction of the iron lighthouse, in the great April storm of 1851.

A company at Chillicothe, Ohio, are building a small iron steamer, calculated to draw about eight inches water, and carry twelve to fifteen persons, to run on the Scioto River, and to be launched on the 4th of July next.

MECHANICS

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ORIGINAL ENGRAVINGS

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